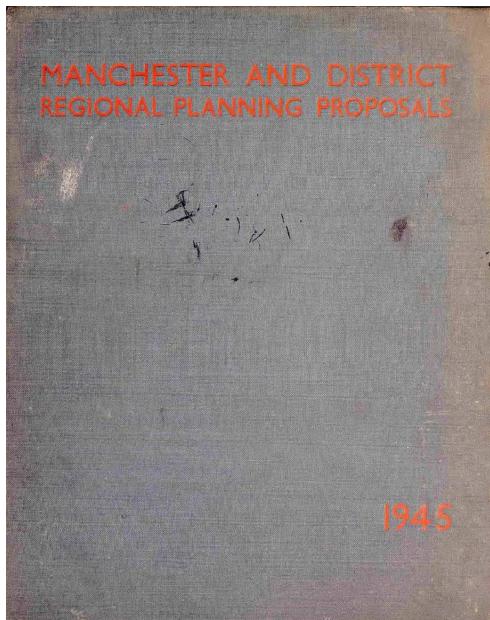


# MANCHESTER AND DISTRICT REGIONAL PLANNING PROPOSALS

1945



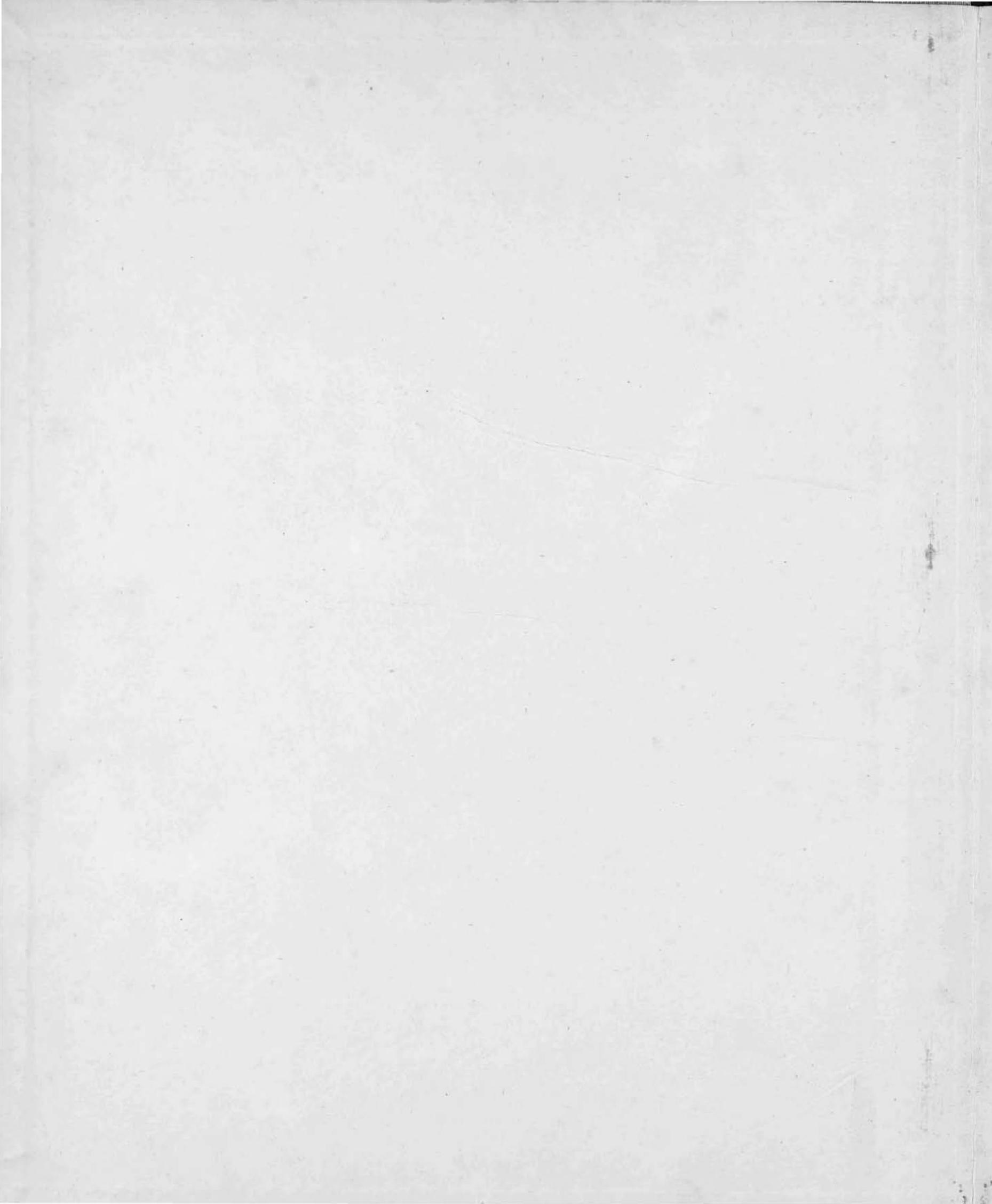
*Manchester and District  
Regional Planning Proposals, 1945*

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# MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

## CONSTITUENT AUTHORITIES



# THE MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

*REPORT ON THE TENTATIVE*

## REGIONAL PLANNING PROPOSALS

BY

R. NICHOLAS, B.Sc., M.Inst.C.E., M.T.P.I.

*Honorary Surveyor to the Committee*

*in collaboration with*

THE MEMBERS OF THE SURVEYORS' SUB-COMMITTEE

WITH A FOREWORD BY

COUNCILLOR T. NALLY (Manchester)

*Chairman of the Regional Planning Committee*

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# MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

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(Salford)

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	H. M. DOXEY (Surveyor) Audenshaw		

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L. L. ALLEN      MISS A. L. RAW      J. D. HUGHES

## FOREWORD

By COUNCILLOR TOM NALLY

*Chairman of the Manchester and District Regional Planning Committee*

IT IS WITH GREAT PLEASURE that I welcome the publication of this Report which indicates in broad outline a suggested plan for future development and redevelopment of the Regional Committee's area.

It is not an easy task to prepare a plan for the Manchester Region: it is a highly industrialised region and embraces a commercial centre whose ramifications and transactions extend far beyond its boundaries; at the same time it provides homes for a population of approximately 1,300,000 persons. The regional plan must therefore give adequate expression to its industrial, commercial, and housing needs. The fact that the region is already largely built up increases the problems which the planner must face.

The necessity for joint action in preparing a plan is clearly apparent; there are no less than 14 local authorities in the region and while each is responsible for the exercise of local government functions within its area there is community of interest between them in economic, social and cultural matters. Indeed, for many purposes the region may be regarded as one and indivisible. This fact no doubt led to an early realisation by the various local authorities that planning could only be successful if the region were treated as a whole and planned as a single unit. The constitution of the Regional Planning Committee in 1928 was the outcome of this realisation and the Manchester and District Committee was one of the earliest statutory joint committees to be established in this country.

In the early years of the Committee's existence the introduction of new planning legislation caused difficulties and delays in its work, but these were gradually overcome and at the outbreak of war in 1939 a draft planning scheme for the region had been prepared on the basis of the planning legislation then in force.

It is, I think, generally recognised that during the war the public have displayed a much keener appreciation of the advantages of bold and wise planning. In 1941 Lord Reith, who was then Minister of Works and Planning, met the members of the Regional Planning Committee and suggested that the draft scheme should be reviewed and an outline plan prepared indicating the lines upon which the Committee considered the region should be developed irrespective of the limitations of planning powers.

The Committee readily accepted this suggestion and entrusted to the Honorary Surveyor (Mr. R. Nicholas) the task of preparing a Report, embodying his views upon the planning and development of the region. This is the Report which Mr. Nicholas has prepared; it is now presented for consideration and criticism before the Committee proceeds to prepare an official plan.

Any such plan must obviously have as its aim and object the well-being of the community for whom it is prepared, and while a plan cannot in itself create employment it must make adequate provision for the future location of industry and commerce; it must ensure that housing areas are set aside and preserved so that the population in the region can live under the best possible conditions; it must ensure the provision of adequate transport facilities; it must ensure that land is reserved for parks, open spaces and other similar amenities and that facilities are available for the social, cultural, and other services which are necessary for the enjoyment of a full measure of life by the people. These must be the basic considerations of any plan, and criticism of the Report should be founded upon those considerations.

Having regard to the magnitude of the proposals embodied in the Report I would like to refer briefly to the questions which will confront the Committee in considering them.

The Committee must in the first place examine them to ascertain whether they meet the essential requirements of the region. This will involve consideration of important questions of planning policy;

the adequacy of the existing legislation for the carrying out of the proposals must then be examined; last, but by no means least, the question will arise of the capacity of the region to finance the proposals.

It will be clear to everyone that the ultimate test which must be applied to planning proposals and projects, however well-conceived they may be, is whether or not they can be carried out without imposing an undue financial burden upon the planning authorities. In this respect the problem of compensation and betterment looms largely in the foreground, for it is quite clear that until this problem is solved planning will make no more progress in the future than it has done in the past. In its White Paper on the Control of Land Use (Cmd. 6537) which was presented in Parliament in June, 1944, the Government, after referring to the introduction of the Town and Country Planning Bill, 1944, stated that "there will still remain to be corrected what is generally agreed to be the defect which most of all prevented or distorted good planning before the war—namely the state of the law regarding the payment of compensation to landowners affected by planning schemes, and the collection of 'betterment' from those who benefit therefrom". The White Paper embodied the Government's proposals for the solution of the problem; while there are many who consider that the Government's proposals are not likely to solve the problem, the present position is that no progress whatever has been made by Parliament in dealing with this question—presumably for the reason that the Government has not been willing to afford to Parliament an opportunity to debate the White Paper—and there are at present no indications that the question is to be debated in the future, or that any legislation is likely to be introduced.

Planning authorities cannot however stand still; they must now prepare plans to guide future development. But while they may make progress in the preparation of their plans and may adopt well-conceived proposals designed to meet urgent and pressing public needs, there is very little hope of the fulfilment of any such plans—however desirable or well-conceived they may be—unless the problem of compensation and betterment is solved. This is a national question and the responsibility for its solution lies with the Government and Parliament, but recognition of this fact gives very little comfort to planning authorities desirous of taking immediate steps to ensure the efficient and enlightened development of their areas.

In preparing this Report the Honorary Surveyor has completed a large task under difficult conditions. The Report merits—indeed demands—the earnest consideration of all interested in the health and well-being of the Manchester Region and its people. The Regional Planning Committee will welcome comment and criticism of the proposals it contains.

Finally I must record the debt which I and other members of the Regional Planning Committee owe to Alderman W. T. Jackson of the Manchester City Council. Alderman Jackson has been a member of the Regional Planning Committee since its inception in 1928 and was chairman from 1928 until his resignation in 1942. During the whole of that time he devoted himself unsparingly to the work of the Committee; his vision and foresight combined with an unrivalled knowledge of the subject were assets which few public authorities have at their disposal, and his great work for the Committee will ever be gratefully acknowledged by those who have been responsible for planning in the Manchester Region.

*Town Hall,  
Manchester, 1945*

TOM NALLY

## AUTHOR'S NOTE

THIS REPORT is intended to serve several purposes. It will provide a basis on which the Regional Planning Committee can develop its plan; it will enable the members of the constituent authorities to consider the implications of the proposals for the development and redevelopment of their areas, so that their observations may become available to assist the Committee in its further work; and it will help the Minister of Town and Country Planning to consider more adequately the need for further legislative and financial assistance to planning authorities.

The Report is based on the application of principles determined by a Technical Sub-Committee comprising the surveyors to the constituent authorities. The detailed proposals have not in all cases been discussed with each surveyor, for such a procedure might have necessitated their submission to his appropriate Committee. It was obviously better that each authority should have an opportunity to consider such proposals within the context of this complete Report.

I must therefore accept full responsibility for the Report; nevertheless I wish to acknowledge fully the willing and generous help I have received from the Technical Sub-Committee as a body and from individual members. They have readily acceded to requests for information and statistics and their knowledge of local conditions has been invaluable in the formulation of the proposals.

The planning staff, under the able direction of the Principal Planning Assistant, Mr. J. J. Brooks, M.Inst.M. & Cy.E., M.T.P.I., have unstintingly given of their best in the arduous work entailed in survey and research and in the build-up of the proposals now presented. Much time out of normal office hours has been willingly and enthusiastically spent in an effort to produce the Report as early as possible.

Members of the Manchester City planning staff have also contributed original research work on such matters as density standards, neighbourhood and district requirements and highway capacities. The two staffs have worked closely together, so as to avoid duplication of effort.

I sincerely hope that the Report may contribute in no small measure to the future prosperity of the region and to the well-being of its residents.

1945

R. NICHOLAS

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Plans based upon Ordnance Survey maps are reproduced with the sanction of the Controller of H.M. Stationery Office.

# I THE REGION

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## CONSTITUTION AND HISTORY OF THE REGIONAL PLANNING COMMITTEE

THE MANCHESTER AND DISTRICT Regional Planning Committee was constituted by agreement on the 25th January, 1928, under and by virtue of the powers contained in Section 2 of the Town Planning Act, 1925. The Committee is authorised to prepare and adopt a joint planning scheme for the area. The constituent authorities retain interim development control but must, in permitting development, have regard to any preliminary proposals agreed from time to time between the Regional Planning Committee and a contracting party directly affected thereby. The first official meeting of the Committee took place on the 26th January, 1928, the constituent authorities at that time being the county boroughs of Manchester and Salford, the municipal boroughs of Eccles and Middleton, the urban district councils of Audenshaw, Denton, Droylsden, Failsworth, Irlam, Prestwich, Stretford, Swinton and Pendlebury, Urmston and Worsley, and the rural district council of Barton-upon-Irwell. [1]

The Committee's constitution was the outcome of a report, published in December, 1925, by the original Manchester and District Joint Town Planning Advisory Committee, which included the following recommendation:

That decentralised statutory town planning committees be set up for certain defined areas, based on local centres, where common interest is fairly close, and where finances over the decentralised areas are likely to be sufficient to warrant the local authorities concerned collectively ensuring the enforcement, and/or the carrying out, of any of the major proposals contained in the statutory schemes.

The constitution of the Regional Planning Committee provides that the constituent authorities shall continue their association with the Advisory Committee through the Regional Planning Committee. (The Advisory Committee is now replaced by the South Lancashire and North Cheshire Advisory Planning Committee.) [2]

During such time as the scheme is being prepared, the constituent authorities contribute to

the expenses of the Committee such annual sums as shall not exceed the product of one-third of a penny rate in the pound on the assessable value for general rate purposes of their respective areas, and the Committee may incur expenditure up to the total of such contributions in connection with the exercise of its functions, provided always that, with the consent of the authorities, the Committee may, if it is considered necessary, vary the amount of contribution in accordance with an estimate of the amount of expenditure likely to be incurred in any particular year. The Committee must prepare an annual report on its work during the preceding twelve months and a statement of expenditure, and copies of such report and statement must be sent to the town clerks of the constituent authorities, for circulation to the whole of the membership of their respective councils. [3]

The constitution provides that the Committee may, from time to time, appoint out of its own body, or otherwise, such sub-committees as it thinks fit for any purpose which, in the opinion of the Committee, could be better dealt with by a sub-committee. The minutes of the proceedings of all sub-committees are subject to the approval of the full Committee. [4]

The following sub-committees have been appointed:

Surveyors' Sub-Committee (The Engineers and Surveyors of the local authorities).

Legal Sub-Committee (The Town Clerks and Clerks of the local authorities).

Ways and Means Committee.

Audit Sub-Committee, and

A Special Sub-Committee to consider the draft scheme.

An honorary clerk, an honorary surveyor and an honorary treasurer to the Committee have also been appointed. [5]

## Representation

At the present time fourteen local authorities are members of the Regional Planning Committee.

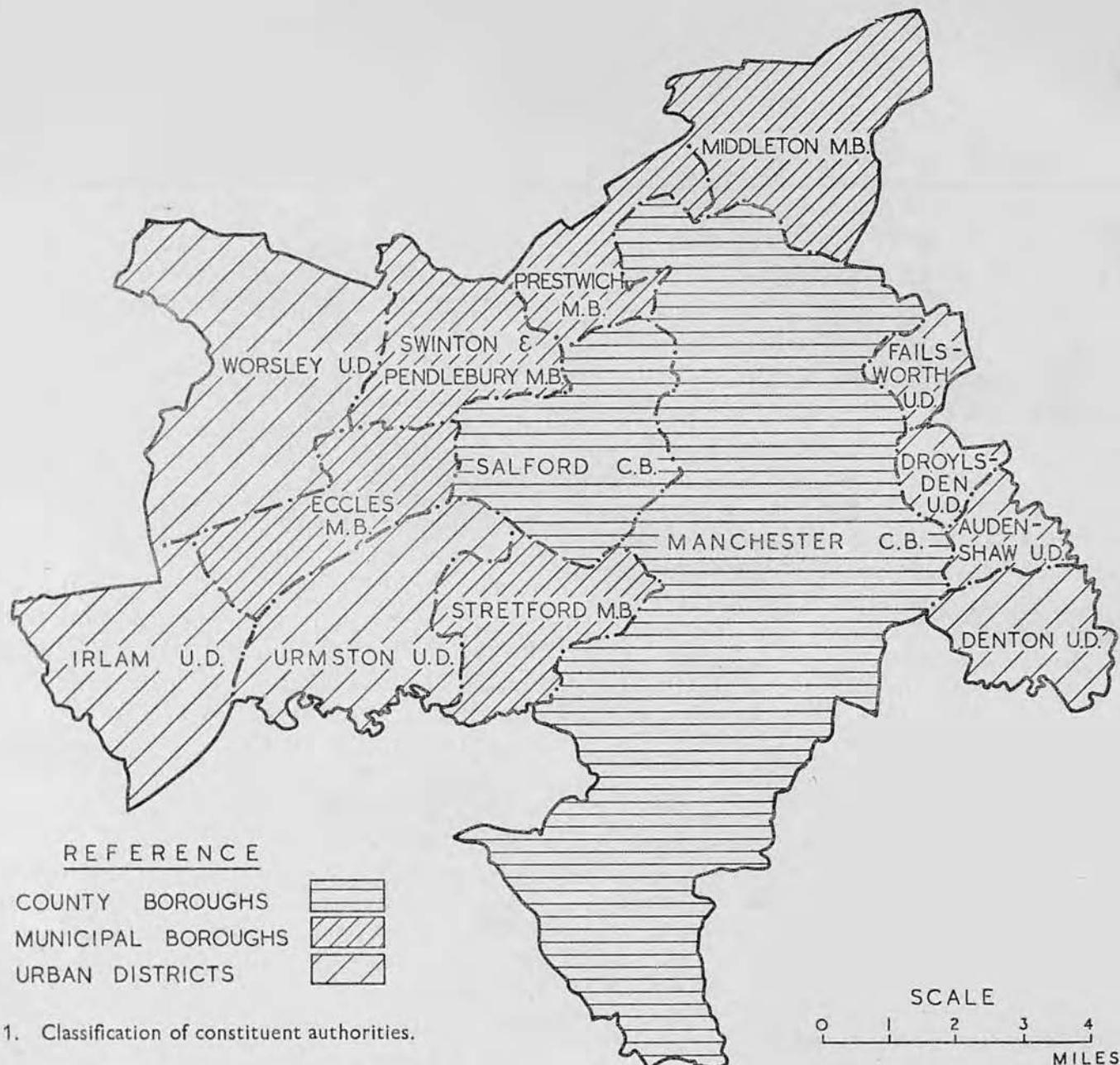


Fig. 1. Classification of constituent authorities.

Their classification and representation are as follows:

Local Authority	Representatives on Committee	Local Authority	Representatives on Committee
Manchester C.B.	10	Audenshaw U.D.	1
Salford C.B. . .	4	Denton U.D. . .	1
Eccles M.B. . .	2	Droylsden U.D. . .	1
Middleton M.B.	1	Failsworth U.D. . .	1
Prestwich M.B.	1	Irlam U.D. . .	1
Stretford M.B.	2	Urmston U.D. . .	1
Swinton and Pendlebury M.B.	1	Worsley U.D. . .	1

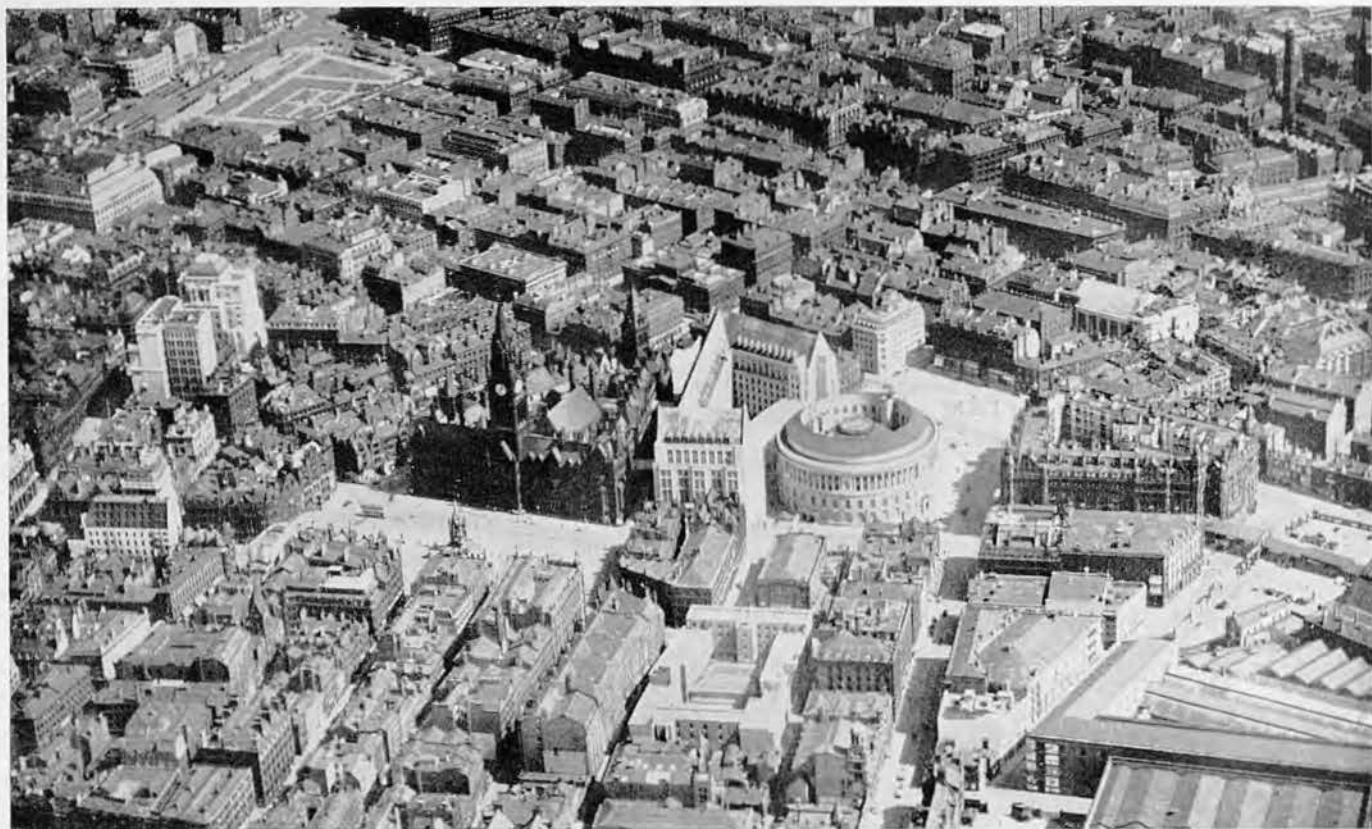
Total representation—28 members

In addition to the constituent authorities, the following bodies are represented on the Committee:

the Lancashire County Council, the Lancashire Rivers Board and the Ministry of War Transport. Liaison has also been established with the Manchester Chamber of Commerce. At the invitation of the Manchester Corporation, the Manchester Chamber of Commerce has established a Planning Consultative Committee and since its inception its services have been placed at the disposal of the Regional Planning Committee. [6]

The Chamber has set up a number of sub-committees:

- (a) A Warehousing Sub-Committee, which has prepared a report on present facilities and future requirements.
- (b) A Railways Sub-Committee.



1

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## CIVIC BUILDINGS

1. Central area, Manchester  
Showing the Town Hall and Central Library.
2. Town Hall, Manchester
3. Town Hall, Salford



2



3



1

*The Architect and Building News*

## CIVIC BUILDINGS



2



3

1. Town Hall, Stretford
2. Town Hall, Swinton
3. Town Hall, Walkden  
(Worsley Council Offices)

(c) A Shops Sub-Committee, consisting of members of the Chamber of Trade, which has held meetings to consider the question of shop facilities in neighbourhood, district and regional centres.

(d) An Industrial Sub-Committee, which has considered the questionnaires used in the detailed industrial survey referred to in Chapter VI. [7]

## STATISTICAL INFORMATION

The following statistics give an indication of the extent and importance of the Manchester Regional Planning Area. [8]

Table 1  
REGIONAL STATISTICS

Constituent authorities	Area (acres)	Population (1938)	Rateable value £s
Manchester	27,255	747,318	6,017,268
Salford	5,202	199,400	1,082,893
Eccles	3,417	42,550	268,052
Middleton	5,170	29,450	161,236
Prestwich	2,420	32,410	236,354
Stretford	3,530	59,670	517,624
Swinton and Pendlebury	3,363	40,360	238,800
Audenshaw	1,241	11,870	72,699
Denton	2,592	21,090	121,739
Droylsden	1,010	23,710	107,873
Failsworth	1,072	17,370	80,036
Irlam	4,717	14,520	81,037
Urmston	4,799	32,030	347,704
Worsley	7,242	24,920	139,043
Totals	73,030	1,296,668	9,572,358

## Population Trends

An investigation of figures abstracted over a period of 18 years (see Appendix 1) shows that the population of the region as a whole advanced steadily from 1921 to 1927, decreased slightly during the industrial crisis of the early 'thirties, rose to a maximum of 1,313,101 in 1935, and subsequently declined to an estimated 1,289,528 in 1939. [9]

Manchester grew steadily until 1935 before declining, whereas in the case of Salford the decline began as early as 1927. The peak populations in these districts were 776,028 and 247,600 persons respectively. With the exception of Eccles, which has shown a steady decline, all the remaining

authorities show an increase up to the year 1939, with substantial increases in the cases of Urmston, Droylsden, Worsley and Prestwich. [10]

The following tables set out the percentage increases and decreases in population from 1921 to 1939.

Table 2  
POPULATION INCREASES  
(1921-1939)

District	Increase in population	Percentage increase
Urmston	25,233	304.0
Droylsden	11,295	82.8
Worsley	11,110	78.2*
Prestwich	13,960	73.9
Audenshaw	4,122	52.3
Irlam	4,800	50.0
Swinton and Pendlebury	9,540	30.2*
Denton	5,199	29.5
Stretford	13,135	28.2
Failsworth	688	4.1
Middleton	940	3.3

\* Boundary alterations are responsible for increase in the cases of Urmston, Worsley, Swinton and Pendlebury.

Table 3  
POPULATION DECREASES  
(1921-1939)

District	Decrease in population	Percentage decrease
Salford	42,500	17.8
Eccles	2,330	5.2
Manchester	7,682	1.3

The population of the region as a whole increased by 47,510 persons during this period, an increase of 3.8 per cent. [11]

## THE SOUTH LANCASHIRE AND NORTH CHESHIRE ADVISORY PLANNING COMMITTEE

The Regional Planning Committee is a constituent member of the South Lancashire and North Cheshire Advisory Planning Committee. This committee provides machinery through which the findings of all research work undertaken by any one regional planning committee can be circulated for the benefit and consideration of other constituent regional planning authorities. [12]

## POPULATION CHANGES

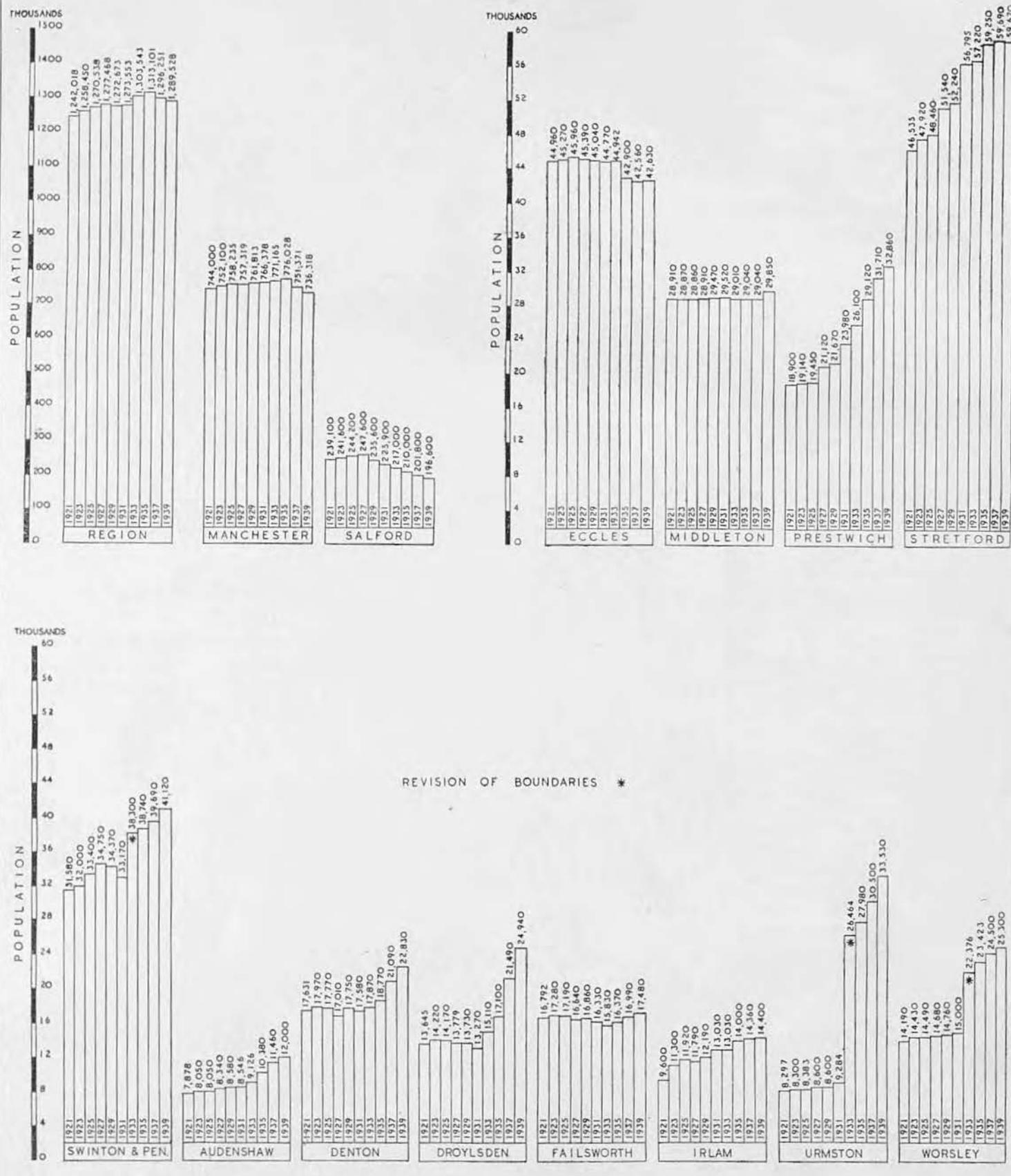


Fig. 2. Population changes in the region from 1921 to 1939 indicating the increases in population in the outer districts.

So far as possible, the Advisory Committee attempts to prevent the unnecessary duplication of similar research work by the different regional planning committees; it also undertakes work in connection with the wider aspects of planning which are beyond the province of the statutory regional committees. The Advisory Committee is also in a position to assist in solving difficulties between adjoining regional authorities and in co-ordinating their work. [13]

The Advisory Committee is representative of the regional planning committees, but before the constitution of the latter it was representative of all the constituent local authorities. It was originally known as the Manchester and District Joint Town Planning Advisory Committee and held its first meeting in the Town Hall, Manchester, on the 14th January, 1921, after a conference representing 76 local authorities within a 15-mile radius of Manchester. [14]

The Advisory Committee later recommended and presented in plan form certain generally agreed outline proposals for the area, viz., regional roads, zoning in broad outline and regional open spaces. It was evident to the Advisory Committee that in order to prepare a detailed plan for the area, the best practicable course would be to set up decentralised statutory planning committees; the immediate establishment of such bodies was recommended in its report issued in December, 1925. [15]

Statutory regional planning committees at present operating in the area of the South Lancashire and North Cheshire Advisory Planning Committee are as follows: Manchester and District, Oldham and District, Chorley and District, Rossendale, Wigan and District, Bolton and District, Bury and District, Rochdale and District, Leigh and District, North-East Cheshire, North Cheshire, East Cheshire, Mid Cheshire No. 4, and Mid Cheshire No. 5. [16]

The planning staffs of the Advisory Committee, of the Manchester and District Regional Planning Committee and of the Manchester Corporation are all housed in the Manchester Town Hall, with the very considerable advantage that the closest liaison exists between the advisory staff and the staffs of the most important regional authority and the largest local authority in the South Lancashire and North Cheshire area. [17]

## THE POSITION AT THE OUTBREAK OF WAR

A preliminary statement was approved by the Regional Planning Committee in principle in December, 1931, and work was started on the draft scheme proposals. The coming into force, shortly afterwards, of the Town and Country Planning Act, 1932, brought into the planning area, in due course, the developed parts of the region, and added considerably to the planning work. In December, 1937, a provisional draft scheme was submitted to the Committee and a special sub-committee was set up to consider it. The position at the outbreak of hostilities was that all the constituent authorities had approved the draft with the exception of Manchester, Salford and Irlam, where the matter was under consideration. [18]

As the war proceeded, the Government considered the question of post-war planning and reconstruction, and in 1941 decided that a national policy should be formulated for the major aspects of planning. The Government also accepted, in principle, the setting up of a national or central planning authority. [19]

Lord Reith attended a meeting of the Regional Planning Committee held on the 28th August, 1941, and explained the Government's policy in relation to post-war planning and reconstruction. He advised the Committee to proceed with the preparation of a provisional plan of redevelopment for the area, and he further suggested that in preparing the plan the Committee should not feel bound by existing legislation but should plan boldly and comprehensively so that when the provisional plan was completed it would be possible to ascertain exactly the problems which would arise in securing the proper development and redevelopment of the region. [20]

After hearing Lord Reith, the Regional Planning Committee adopted the following resolutions:

(1) That this Committee approves the preparation of a provisional plan of redevelopment for the Committee's area; such plan to be capable of any necessary adjustment as the war proceeds and with which any reconstruction or redevelopment after the war might be made to conform.

(2) That the Surveyors' Sub-Committee be directed to proceed with the preparation of such provisional plan and to report thereon to this Committee as soon as practicable. [21]

The Surveyors' Sub-Committee has since given consideration to the many problems involved. The preparation of a plan for the Manchester and District Region has been a vast and complicated task, and in view of the changed outlook towards planning in recent years it has been necessary to review and re-examine all the proposals embodied in the draft scheme. [22]

The Ministry of Town and Country Planning has emphasised the fact that surveys form the groundwork of planning. The Ministry is itself engaged in assembling the material required to provide a comprehensive picture of development and redevelopment in the country as a whole, but this information is not yet available; in any case it must be and has been supplemented by detailed local surveys. [23]

In July, 1944, the Surveyors' Sub-Committee presented to the Regional Planning Committee the tentative regional planning proposals upon which

this Report is largely based, and the Committee then agreed that the Honorary Surveyor, in collaboration with the Surveyors' Sub-Committee, should prepare this Report for publication. It will be appreciated that this Report does not, therefore, necessarily represent the unanimous opinion of the Surveyors' Sub-Committee, that it is in no way binding on the individual members of the Surveyors' Sub-Committee so far as their own authorities are concerned, and, further, that it has not been considered or approved by the Regional Planning Committee. It has been prepared and is published for the specific purpose of bringing before the members of the constituent local authorities and all other interested parties proposals upon which opinions are sought by the Surveyors' Sub-Committee and the Regional Planning Committee, in order that, in preparing and completing the regional planning scheme, such opinions may be properly taken into account. [24]

THE REGIONAL PLANNING AREA may be regarded as a buffer between the Cheshire plain and the Pennine uplands. The general topography varies considerably, the levels ranging from below the 50-foot contour line in the south-west to over 700 feet in the north-easterly tip of the region at Middleton (see Fig. 3). [25]

The city of Manchester functions as a commercial centre not only for the region, but far beyond it. It has been estimated that 4,000,000 people reside within a 20-mile radius of Manchester and 10,250,000 people within a 50-mile radius. [26]

The region is bounded to the north and east by a series of industrial towns which may be regarded

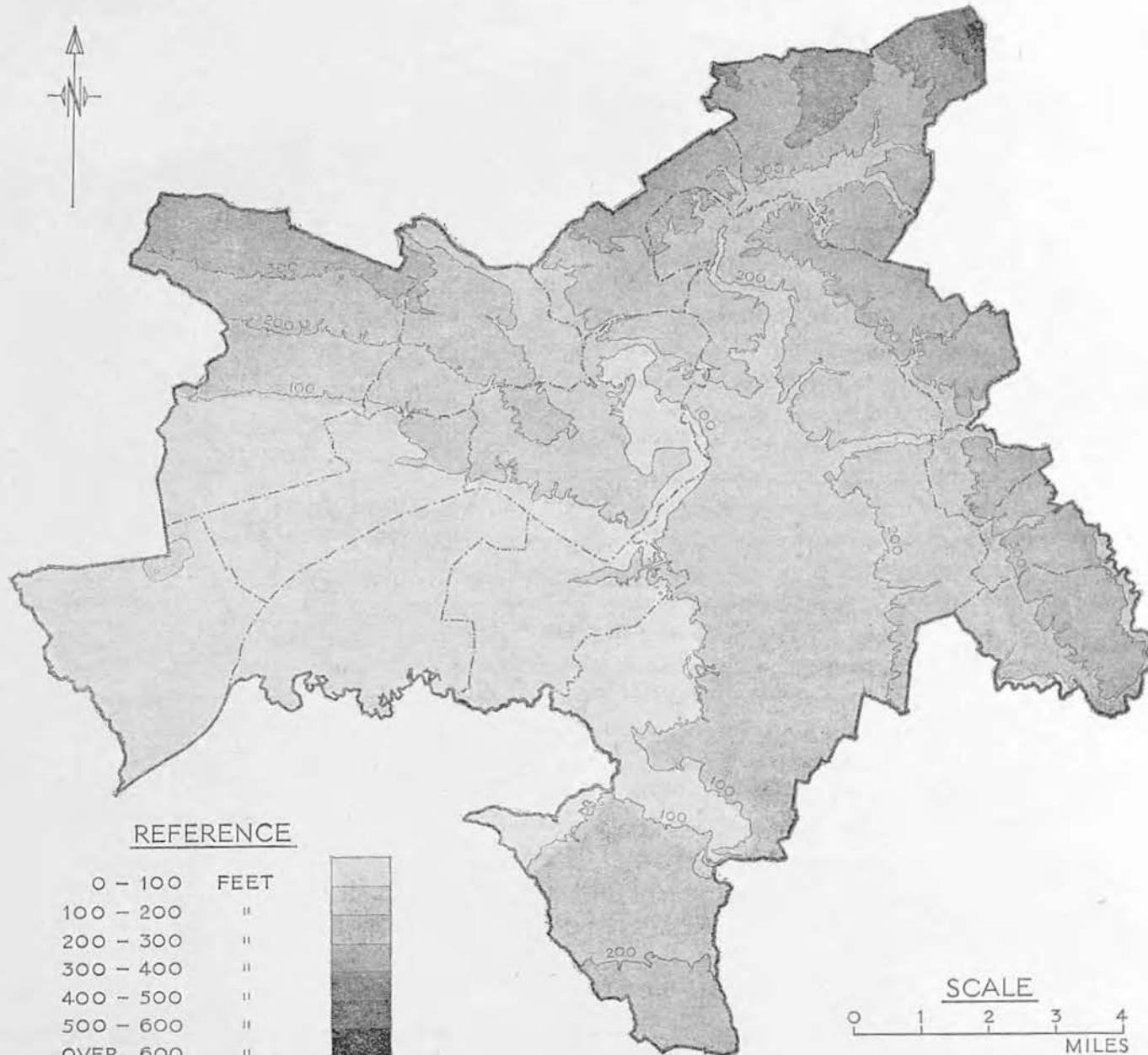


Fig. 3. CONTOUR MAP.

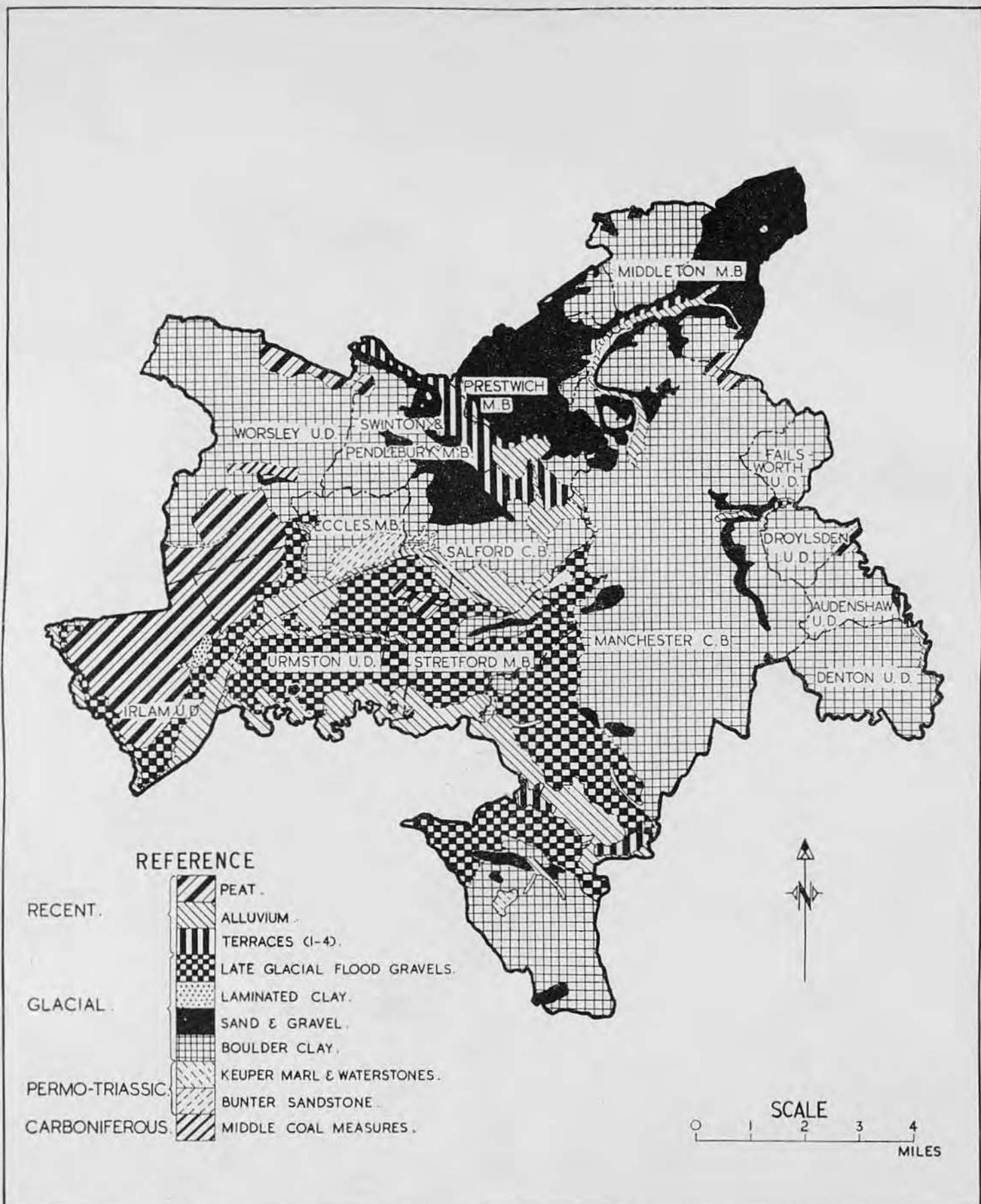
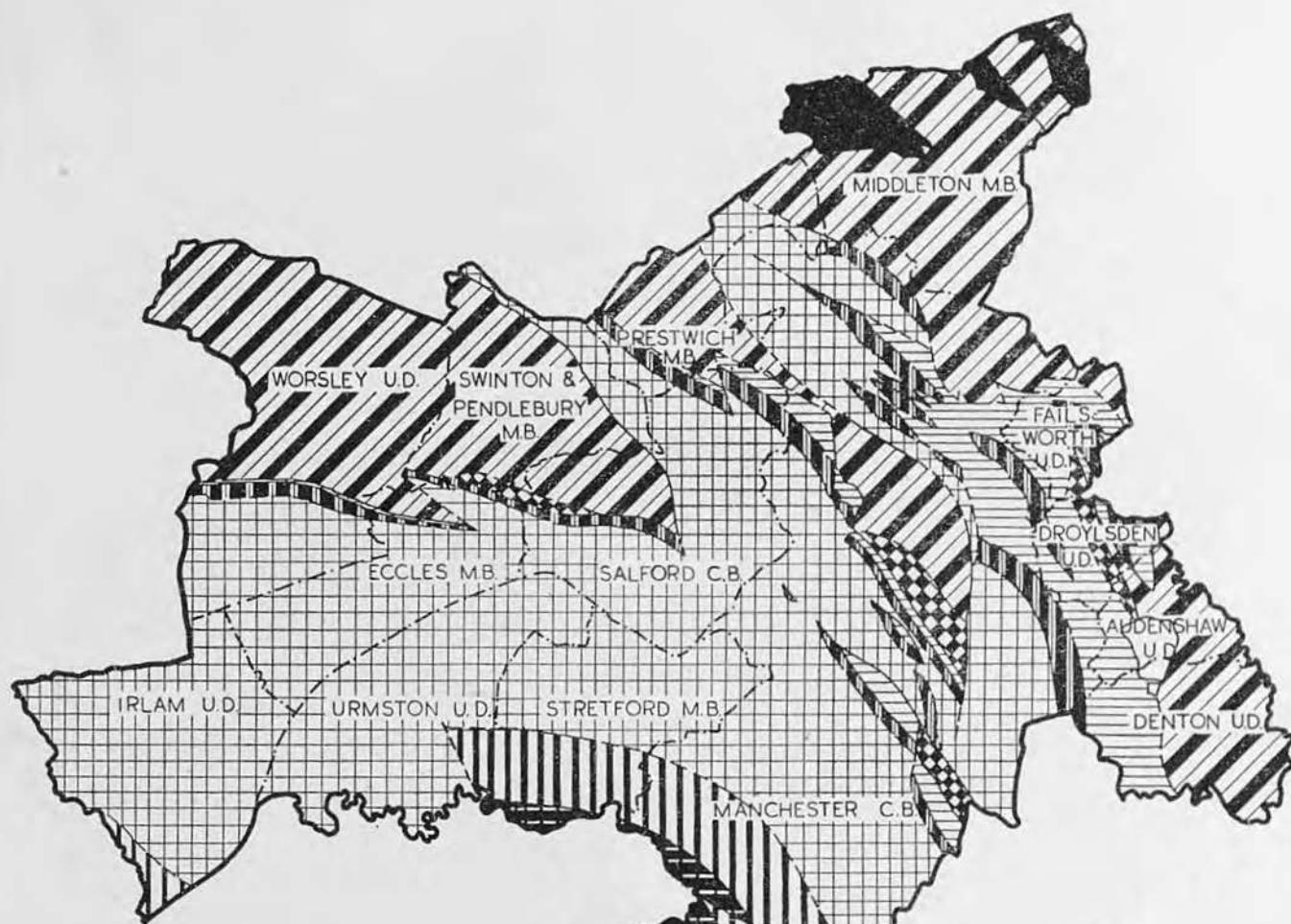


Fig. 4. GEOLOGICAL STRUCTURE-DRIFT showing the superficial drift deposits in the region.



#### REFERENCE

PERMO-TRIASSIC	KEUPER MARL & WATERSTONES.
	KEUPER SANDSTONE.
	BUNTER SANDSTONE.
	MANCHESTER MARLS.
	COLLYHURST SANDSTONE.
	UPPER COAL MEASURES.
	MIDDLE COAL MEASURES.
CARBONIFEROUS	LOWER COAL MEASURES.



#### SCALE

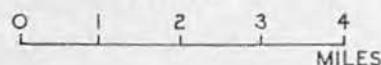


Fig. 5. GEOLOGICAL STRUCTURE-SOLID showing the distribution of solid rocks in the region.

as satellites, viz., Bolton, Bury, Heywood, Rochdale, Ashton-under-Lyne, Oldham, Stalybridge, Hyde and Stockport. These towns developed originally as centres of the cotton spinning and weaving industries because natural water supplies were available and coal supplies near. [27]

## GEOLOGICAL

The geological formations found within the regional area are composed of:

(a) Drift deposits—Peat, alluvium, river terraces, glacial sand and gravel, and boulder clay.

(b) Solid rocks:

(1) Permo-triassic rocks (Keuper marl and waterstones, Keuper sandstone, Bunter sandstone, Manchester marls and Collyhurst sandstone).

(2) Carboniferous rocks—Upper, Middle and Lower Coal Measures. [28]

*Drift deposits* (Fig. 4, page 8):

Boulder clay is the most persistent of the drift deposits and occurs in most districts. It is particularly predominant in Manchester, Worsley, Eccles and in the easterly districts of the region, i.e., Failsworth, Droylsden, Denton and Audenshaw. [29]

Morainic sands and gravels appear in the eastern half of Middleton and cover most of the Prestwich area. They appear also in the northern parts of Manchester and Salford and extend up the valley of the River Irwell to Clifton. An area of late glacial flood gravels covers practically the whole of the districts of Stretford and Urmston and extends along the valley of Worsley Brook to Eccles. [30]

High terrace sands and gravels make their appearance chiefly in the Irwell Valley at Clifton and Lower Broughton, while alluvium deposits are found along the courses of all the rivers and larger streams. [31]

Peat occurs in two separate areas in the region, the larger and more important covering Chat Moss and extending from the south of Worsley to include part of Eccles (Barton Moss) and the greater part of Irlam. [32]

The Middle Coal Measures in the carboniferous series outcrop in the

Worsley area, while the Bunter sandstone of the permo-triassic series outcrops in the southern part of Eccles. [33]

*Solid rocks* (Fig. 5, page 9):

These are rarely exposed at the surface, being hidden by the overlying drift deposits. [34]

The coal measures attain a maximum thickness of 7,000 feet and consist of a succession of shales and sandstones with coal seams. Coal seams are numerous in the Middle Coal Measures and to a lesser extent in the Lower Coal Measures. The Upper Coal Measures are devoid of workable seams. [35]

The permo-triassic rocks consist of red sandstone with marls which rest, with a marked discordance, on the underlying coal measures. They outcrop in the southern and south-western parts of the region, where they attain, in places, a thickness of well over 1,000 feet. [36]

The coal measures have a general southerly, south-westerly, or westerly dip and this results in their outcropping being confined to the northern and eastern margins of the area. In general, progressively higher measures come up towards the south and south-west; finally in this direction they are overlain by the permo-triassic rocks. [37]

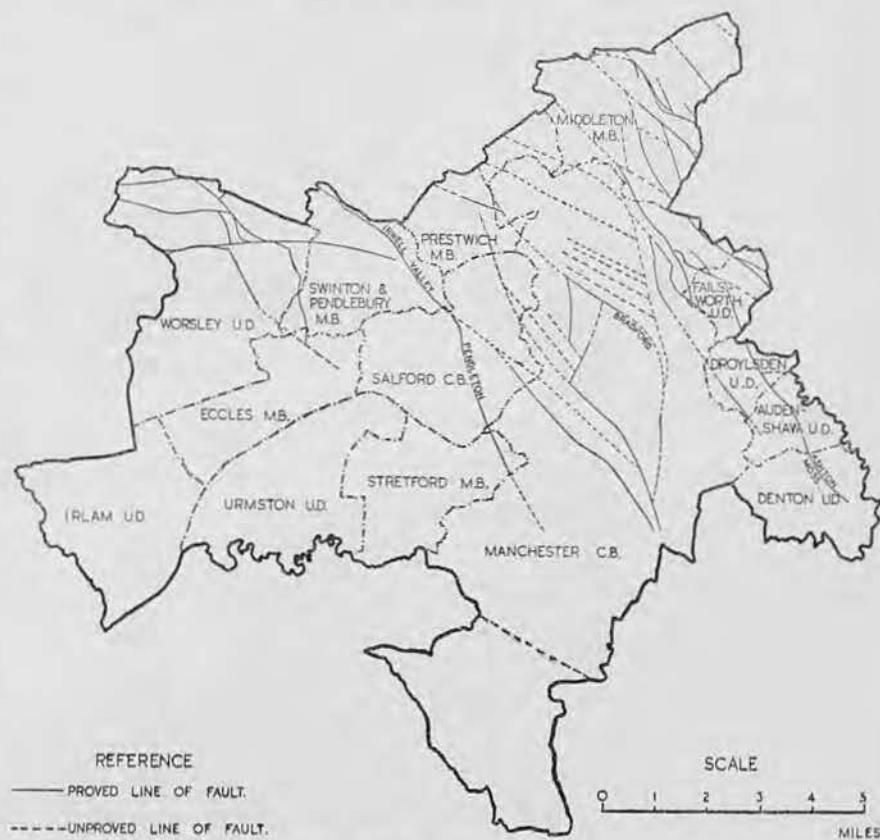


Fig. 6. Major geological faulting in the region.

The rocks, however, are interrupted by numerous fractures and faults (Fig. 6), which in the main down-throw to the north-east. Of these, three have displacements exceeding 1,000 feet, namely the Irwell Valley—Pendleton fault, the Bradford fault, and the Ashton Moss fault. Many small faults have been proved in lower coal seams though they are not present in seams nearer the surface. An example of this type of faulting occurs at Bradford, in Manchester, where a fault which has been proved to have a throw of 90 feet in the Ashton Great Mine is entirely absent in the Parker Mine, 1,100 feet above. This is the largest known fault which fails upwards. [38]

### Mining

The most important mineral product of the region is coal, and pits are at present worked at Worsley, at Swinton and Pendlebury, and at Bradford and Moston in Manchester. Most of the coal near the outcrop of the seams has been removed and mining operations now take place at a considerable depth. [39]

Within exposed coalfields (those parts of the coalfield which are not covered by the permo-triassic rocks), the most valuable seams are being exploited or have been exhausted. The available reserves of these seams vary considerably from colliery to colliery. In these collieries there is a possibility of further reserves from less important seams not at present being worked. The practicability, however, of working thin seams, and of marketing coal from them, depends upon future technical developments. [40]

As to reserves from the well-known valuable seams, future prospects lie in following these beneath the permo-triassic rocks into areas at present unproved. A very important factor governing the exploitation of the coal seams beneath the permo-triassic level is the depth at which these can be worked. At present, the normal maximum depth is usually taken at about 4,000 feet, but already, in the nearby district of Leigh, coal is being wrought at a few hundred feet below this level. Nevertheless, as the coal measures attain an overall thickness of 7,000 feet, and the permo-triassic rocks a depth exceeding 1,000 feet in some places, it is clear that many of the valuable seams lie at depths which to-day may be regarded as unworkable. [41]

### MOSSLANDS

One of the characteristic features of the region is the mossland. Mosslands in their original undrained state were wastes of marsh and peat-bog occupying depressions and small basins, usually in the boulder clay prevalent in the region. The largest tract is the series lying near the Mersey valley, between Manchester and Warrington. A large part has now been drained by a combination of deep ditching and the dumping of refuse by the Manchester Corporation. The latter authority owns two large estates, one south of the region at Carrington and the other at Chat Moss. These once raw, barren and useless boglands have been largely reclaimed and are now among the most productive agricultural lands. [42]

The reclaimed mosslands have a black, peaty soil, light in texture and easy to work. Some parts are worked intensively and grow a large variety of vegetables; rhubarb and celery are widely cultivated, partly because these crops are tolerant of slightly acid conditions. [43]

It was over Chat Moss that George Stephenson constructed the Liverpool-Manchester railway. The difficulties encountered on the four-mile stretch of the moss were so great that at one time it was thought the work would have to be abandoned. It was only the dogged perseverance of the engineer that brought eventual success to the undertaking. [44]

The mosslands are not suitable for development, and have been included in the proposed green belt round the Manchester district (see Chapter III). [45]

### RIVERS

The chief rivers in the region are the Mersey, Irwell, Medlock, Irk and Tame. The valleys of the Irwell, Medlock and Irk have, in the past, attracted industrial development, much of which still remains (see Plate 3, facing page 12). The disposal of industrial effluent has deprived the rivers of most of their amenity value. Consideration has been given to the extent to which it may be possible to regain some of these lost amenities. [46]

The Lancashire Rivers Board (the authority for controlling the discharge of trade wastes into the rivers) has already done a great deal to improve the condition of the rivers in the area. Further progress can be expected as industrial undertakers

are compelled effectively to cleanse their effluents or alternatively pass them into the public sewers. [47]

Another cause of pollution is the periodic overflow of storm water from public sewers. This is particularly noticeable in the smaller streams where, as they subside, accumulations of offensive material are left behind. [48]

Redevelopment to modern standards (see Chapter IV) will mean a considerable increase in the provision of open spaces and a "loosening out" of the congested residential and industrial development. There will thus be an increased area of pervious open ground and a reduction in the amount of storm water passing into the sewers. Consequently, storm-water overflows will operate less frequently and a greater degree of dilution will be secured than at present. Further improvements may be obtained by the construction of relief storm-water sewers discharging into rivers at selected points where the effects would not be injurious to amenities. [49]

The Mersey should show a continuing improvement in its condition and there should be no doubt as to its future amenity value. In the main, throughout the regional area, the river passes through undeveloped land (see Plate 3, facing this page), which, in parts, provides good recreational facilities in the form of golf courses, sports fields and riverside walks. The river is liable to flood at certain periods and in many places the banks are subject to severe erosion: The Rivers Mersey and Irwell Catchment Board is now carrying out some permanent works of improvement and these will be extended as and when required. Tipping is also being undertaken by the Manchester Corporation to alleviate flooding in its area. When these works are completed a large area of parklands will be formed offering almost unlimited landscaping opportunities. [50]

The Irwell forms the boundary between Manchester and Salford from Lower Broughton to Pomona Docks. At Peel Park, Salford, the river has already been developed as an amenity feature. Other open spaces adjoining the river are the Manchester Racecourse and the David Lewis Recreation Ground. Between Peel Park and the regional centre the river is bounded by a ribbon of mainly heavy industrial premises which cast a blight over the adjoining areas of residential development. If these areas are to be redeveloped

satisfactorily, the riverside industries must be removed. Such an undertaking can only form part of a long-term programme but as it is gradually effected the riverside treatment at Peel Park should be continued to Strangeways. In the meantime the quality of the river water should have improved so that the river and riverside park would combine to form an exceptional and much-needed amenity feature. [51]

Industrial development has taken place along the Irk valley. However, adjoining the Manchester-Middleton boundary the Irk runs through green-belt reservations and should be improved as a natural feature. [52]

The Medlock valley gives opportunities for improvements. It is proposed that Clayton Vale on the Manchester-Droylsden boundary should be levelled by tipping to form playing-fields which are lacking in this part of the region. Here, therefore, the river should be straightened and culverted. In Philips Park the water is reasonably clean. [53]

The Tame, at Denton, flows through the green-belt reservation, greatly adding to its amenities and providing extensive riverside walks with ample opportunities for park treatment. [54]

In areas zoned for industrial and commercial purposes, particularly in the redevelopment areas, the polluted rivers might well be straightened and culverted where this will give better-planned layouts. [55]

In other cases every effort should be made to develop the amenities of the rivers and streams in the regional area. [56]

## AGRICULTURE

Although for all practical purposes the region may be considered urban in character, there are certain lands devoted to farming and agriculture. These are covered by a land-classification survey of the Greater Manchester area prepared by the General Planning Division of the Ministry of Agriculture. The area included in this survey lies roughly within a radius of 10 to 15 miles from Manchester and includes the major part of that covered by the South Lancashire and North Cheshire Advisory Planning Committee. [57]

The classification of land is broad and relates to a national standard; consequently some local differences, which might be quite distinctive, are not indicated. [58]



2

## RIVERS

### 1. The Medlock

### 2. The Irwell

Typical examples of riverside industrialisation with consequent pollution and loss of amenity value.

### 3 & 4. The Mersey

Unspoiled reaches of the river with amenities preserved providing pleasant riverside walks.



4



1



2

## RIVERS

1. The Irwell  
Higher Broughton,  
Salford.
2. The Mersey in flood  
Lands liable to flooding  
are included in the  
green belt.

Surrounding the Manchester conurbation are examples of most types of land; those of the greatest agricultural value in the regional planning area lie for the most part to the south and southwest on Barton Moss and Chat Moss in the districts of Irlam, Eccles and Worsley. The preservation of these mosslands, with their highly productive and easily worked soils, is imperative, as they rank with the best agricultural land in the country. [59]

Good general-purpose land suitable for arable farming extends along the south-westerly boundary of the region, but is broken up by development. [60]

Medium-quality general-purpose land, predominantly suitable for grass, covers the north-easterly tip of the region at Middleton, and also the north-westerly tip at Worsley. This type of

land also occurs in Prestwich, Swinton, Failsworth and Droylsden, but here again it is mostly broken up by development. [61]

Every effort must be made to preserve, where possible, the better-class lands. Fortunately the mosslands are not suitable for development; the medium-quality lands at Worsley and Middleton have, to a large extent, been reserved in the green-belt scheme (see Chapter III). [62]

The spread of development in the Manchester region in the past has had a marked effect on agriculture. The effect of building is by no means confined to the area of actual building operations. Farms may be cut in half and their efficiency

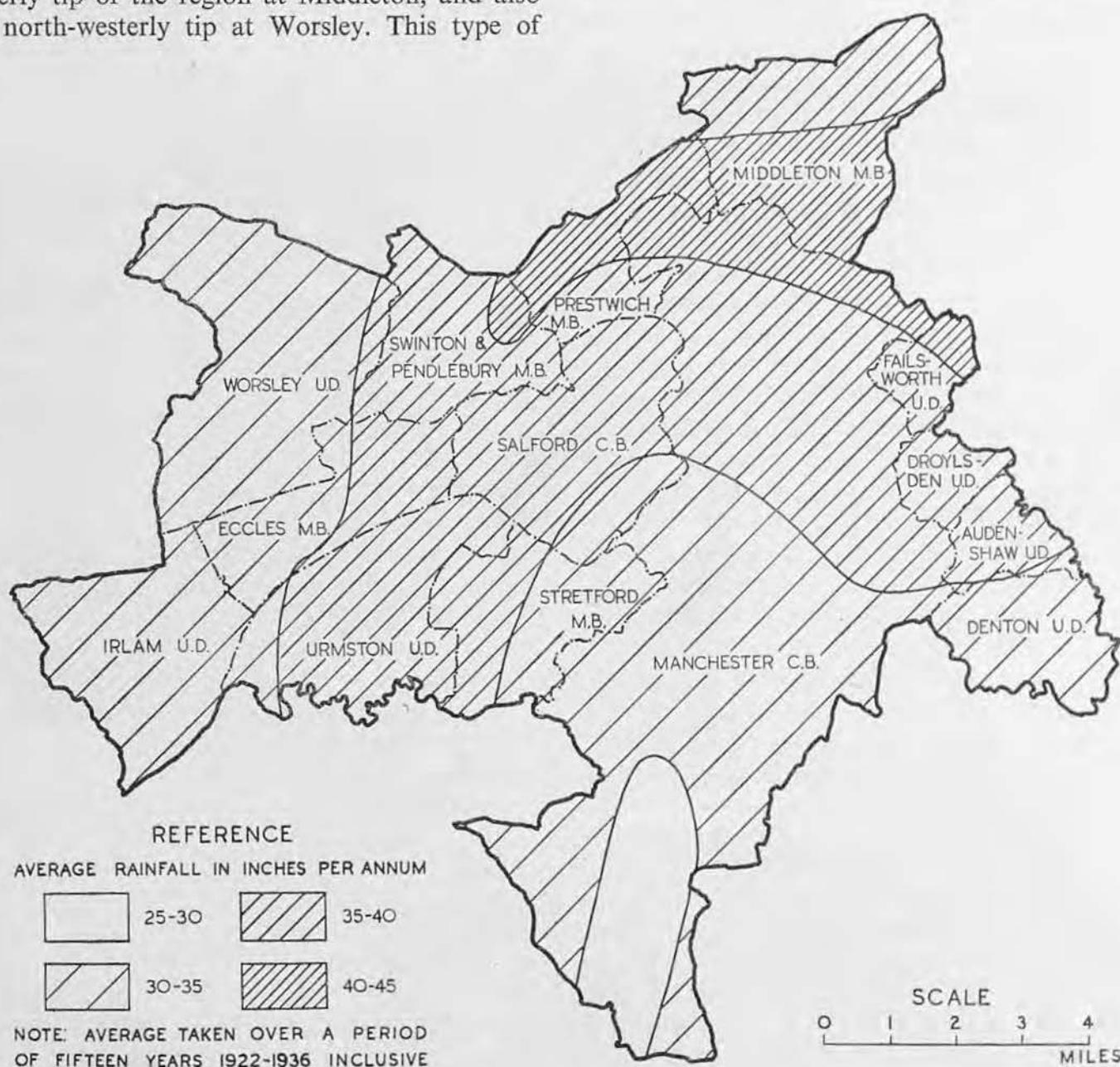


Fig. 7. RAINFALL DIAGRAM

thereby impaired. This has often been the case in this region. The principal trend of development has been to the south and it is here that the damage has been greatest, being particularly noticeable at Sale, Altrincham and Wythenshawe. [63]

Atmospheric conditions make the lands to the north-east unsuitable for arable farming or the cultivation of cereals. The atmospheric impurities, the resulting lack of sunshine and the presence of chemical fumes from the industries of the region, all discourage such forms of agriculture. [64]

### CLIMATIC CONDITIONS

Detailed information about the climatic conditions prevailing throughout the regional area and beyond is of paramount importance when consideration is being given to the problem of large-scale residential redevelopment, and, in particular, to the siting of any proposed satellite town. Statistics indicating the average annual rainfall and also the number of wet days per annum throughout the area over a 15-year period (1922-1936 inclusive) have been taken from the publications of the Meteorological Office. A wet day is defined as one on which the rainfall exceeds 0.04 of an inch, and the number throughout the region is fairly constant, averaging between 150 and 160 per annum. To the north and north-east of the region the figure rises to 160 to 170 per annum. [65]

Rainfall varies considerably over the region and increases as the ground rises to the north-east towards the Pennine slopes (Fig. 7). In Manchester alone the variation ranges from 25 to 30 inches per annum at Wythenshawe to 40 to 45 inches per annum in the northern part of the city—an increase of from 10 to 15 inches per annum in a distance of approximately  $7\frac{1}{2}$  miles. South Manchester, Worsley, Eccles, Denton and the eastern part of Stretford are in the 30- to 35 inches range. The northern parts of Manchester and Prestwich and the southern part of Middleton average 40 to 45 inches, while the remainder of the region generally averages 35 to 40 inches per annum. As the higher slopes of the Pennines are reached outside the regional planning area the rainfall shows a substantial increase, averaging 60 to 65 inches per annum in the Rossendale region and in the northern part of the Rochdale regional planning area, with an average of 180 to 190 wet days per annum. [66]

### SMOKE ABATEMENT

The region, in common with most large industrial areas, suffers from smoke and atmospheric pollution, with a consequent lack of sunshine. The following figures, giving the mean annual sunshine hours, averaged from 1906 to 1935, are indicative of the need for pursuing a vigorous smoke-abatement policy.

Manchester (Oldham Park) .. .. ..	967 hours
Manchester (Whitworth Park) .. .. ..	1,026 hours
Hoylake (Cheshire) .. .. ..	1,504 hours
West Kirby (Cheshire) .. .. ..	1,523 hours

[67]

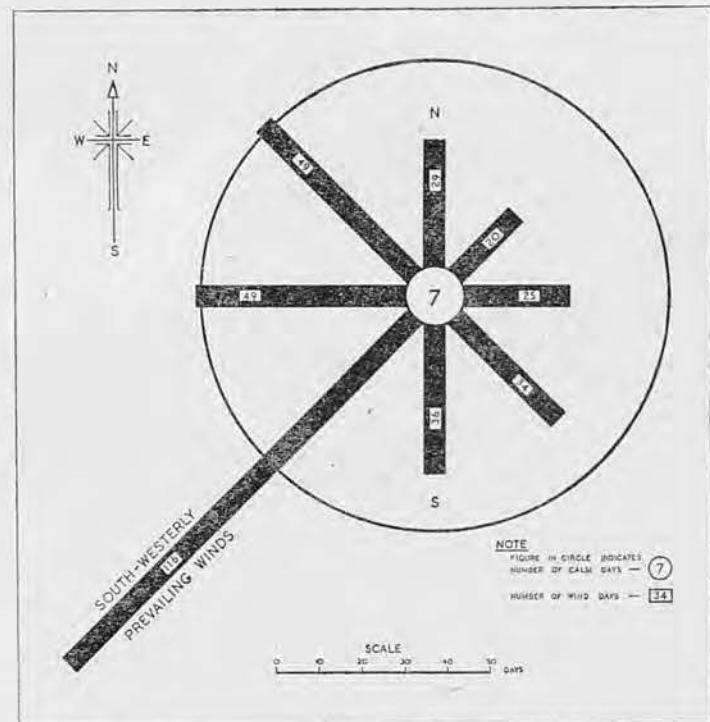


Fig. 8. Wind direction diagram indicating prevalence of south-westerly winds.

Conditions in the Manchester region—humid atmosphere, south-westerly prevailing winds, and hills to the north and east—tend to maintain pollution in the atmosphere rather than disperse it, thus aggravating fog and overcast conditions. [68]

Where the atmosphere is clear, the condensation taking place becomes visible as cloud, but where the condensation takes place in an atmosphere laden with smoke particles, the familiar grey smoke pall is formed and under certain conditions descends as a fog. The ill-effects of such a smoke pall are obvious, e.g. sickness and high mortality rates, the erosion of buildings, and the discouragement of good agriculture. When it is realised that the

Table 1 ATMOSPHERIC POLLUTION

District	Recording station	Height above sea level (feet)	Deposited matter (tons per sq. mile)	Nature of surrounding development
Manchester ..	Philips Park .. .. .. ..	190	481.56	Industrial
	Rusholme .. .. .. ..	132	318.24	Residential
	Monsall Hospital .. .. .. ..	246	218.88	Semi-industrial
	Booth Hall Hospital .. .. .. ..	265	172.20	Residential
	Withington Hospital (South Manchester)	108	170.52	Residential
	Heaton Park (North Manchester) ..	260	143.04	Residential
Salford ..	Baguley Sanatorium (Wythenshawe) ..	145	119.64	Semi-rural
	Ladywell Sanatorium .. .. ..	100	261.00	Industrial
	Peel Park .. .. .. ..	100	239.52	Industrial
Prestwich ..	Drinkwater Park .. .. .. ..	100	239.28	Residential
Marple (Cheshire)	Sanatorium .. .. .. ..	250	113.04	Semi-rural
Lymm (Cheshire)		100	93.84	Rural

average man or woman inhales between 30 and 35 lbs. of air per day, the harmful effect on the respiratory system of a fume-ridden atmosphere may be appreciated. [69]

The problem of atmospheric pollution is one of considerable magnitude. Some idea of the position may be gained from a study of the figures in Table 1 above, supplied by the Medical Officer of Health to the City of Manchester. They represent annual averages in tons per square mile of matter deposited in the region and adjoining districts during the years 1935 to 1939, the prevailing winds being west and south-west (Fig. 8). [70]

The sulphuric content of smoke deposit, when brought down by rain, causes flaking of the surface and loss of detail in stone buildings and corrosion in metal structures. Steel rails in an industrial area have been found to lose over a pound in weight per year, as against 0.18 of a pound in coastal districts. [71]

Observations on wind direction in the region reveal that the prevailing wind is south-westerly, the figures being as follows:

South-westerly ..	116 days	North-easterly ..	20 days
Westerly ..	49 days	Easterly ..	25 days
North-westerly ..	49 days	South-easterly ..	34 days
Northerly ..	29 days	Southerly ..	36 days

The average wind velocity is three to ten miles per hour. [72]

#### District heating

Thirty-seven million tons of coal were consumed annually before the war for domestic purposes. The ordinary domestic fire, though traditionally

part and parcel of the English home, is acknowledged to be one of the most wasteful forms of combustion. During the last 40 years, technical developments in industrial coal-burning plants have improved their efficiency and diminished the smoke pollution from industrial sources, but there has been little improvement in the normal household coal-burning grate during this period. [73]

New methods of combustion, the use of smokeless fuels, and the provision of district-heating systems would do much to rid the region of its pall of smoke. The overcast conditions in the Manchester region are such that all smoke-producing open fires must eventually be dispensed with, if the residents are to obtain those conditions of sunlight and clean air so essential to their general well-being. [74]

Schemes of district heating have been widely adopted in the United States of America, in the Soviet Union and on the Continent, but there are only two schemes known to exist in the British Isles for supplying both hot water and heat to domestic buildings. These, for housing estates of 250 and 268 dwellings respectively, have been in operation at Dundee since 1920, and work at a charge to the tenants of 4/3 per week for each three-bedroom cottage. [75]

Manchester Corporation has set up a Smoke-Abatement Technical Committee to consider methods of alleviating the smoke nuisance, and much research has been undertaken. Investigations have been made into the possibilities of providing a district-heating scheme for the Wythenshawe

Estate. It has been estimated that the average householder in the developed part of this estate spends 6/3 per week on the purchase of coal—an average annual consumption of five tons. [76]

District-heating estimates have been calculated on the basis of providing a temperature of 60° Fahr. in living-rooms and 50° Fahr. in bedrooms and other rooms for a period of 17 hours each day (from 6 a.m. to 11 p.m.), for 30 weeks in the year, and hot water for each person at 40 gallons per day, at a temperature of 130° Fahr., during the whole of the year. The costs have been estimated on present-day prices which, in the case of buildings, have been assumed to be 100 per cent above pre-war costs, and for civil-engineering work (e.g., pipe ducts) 40 per cent above pre-war costs. [77]

It has been found that charges of 5/- per three-bedroom house per week and 4/- per flat per week, with proportionate charges for heat supplied to public and industrial buildings, would make the scheme self-supporting when the estate was fully developed. There would thus remain 1/3 per week for such topping-up fuel as the tenant may desire to use. [78]

It is emphasised that the warmth which would be provided by such heating would be vastly greater than that which is obtained from present arrangements. The useful heat put into each house would be 530 therms as against 235 therms from the coal at present being burnt in inefficient grates. Apart from the very great advantage of smoke

abatement conferred by district heating, house-holders would experience conditions of comfort which they have not been able to afford in the past, and cleaner air would mean a considerable saving on the cost of decorations necessary to house property. [79]

With Wythenshawe fully developed, and allowing one ton of smokeless fuel per house for topping-up, 7,000 tons of coal could be saved per annum. [80]

District heating is also advantageous for space-heating of industrial estates, as has been proved in existing schemes. As long ago as 1911 the Manchester Corporation started a scheme to supply surplus steam to warehouses in the vicinity of the Bloom Street electricity generating station. Eventually 12 warehouses were supplied over an area of approximately 20 acres, and although electricity is no longer generated at these works, the scheme is highly efficient and is giving entire satisfaction to the firms connected. [81]

In conclusion, it cannot be too strongly emphasised that a vigorous smoke-abatement policy is essential in the regional area because the natural atmospheric conditions which prevail make the effects of pollution so continuously evident in so many sunless, dull and dreary days. One generation of intensive development in district heating and in the use of smokeless fuels could surely bring to the regional conurbation the better and brighter conditions which at present prevail in the Ringway and North Cheshire area. [82]

THE  
SMOKE  
NUISANCE



1



1. Smoke pollution in congested residential areas
2. Industrial smoke
3. Improved conditions in open development

A vigorous smoke-abatement policy is essential in the regional area because the natural atmospheric conditions make the effects of pollution evident in many dull and dreary days.



3



1

## PARKS AND GARDENS

### 1. Heaton Park, Manchester

The largest of the Manchester parks, providing many forms of recreation. Area approximately one square mile.



3

### 3. Garden of Remembrance, Middleton

### 4. Alexandra Park, Manchester

One of the earlier Manchester Parks, acquired 1868.



2

### 2. Davyhulme Park, Urmston

An example of formal park treatment.



4

THE BUILT-UP AREAS of the region suffer from a general lack of open space, whilst the inner congested areas, developed during the industrial era, reveal a serious deficiency. [83]

There must be made available to the public sufficient playing-field space to enable children and adults alike to acquire the habit of healthy outdoor exercise, which is conducive to positive health and vigour and is the physical foundation of a fit and active nation. If we are planning for a better world we must provide active relief from the mechanical monotony of our working conditions. [84]

Parks, parkways and footpaths give pleasant and convenient walks within easy reach of residential development. Ornamental gardens, lawns, trees and shrubs provide a fresh and attractive setting for housing estates, exercising a softening influence on the hard lines of the buildings and brightening the frequently drab appearance of the suburban layout. [85]

A striking indication of the congestion prevailing in the central areas is given by the following statistics obtained in the course of a residential survey of Manchester, Salford and Stretford.

District	Ward	Population	Public open space (acres)	Open space per 1,000 persons (acres)
MANCHESTER	All Saints ..	20,489	6.62	0.32
	Ardwick ..	21,970	6.07	0.28
	Cheetham ..	22,712	1.16	0.05
	Collyhurst ..	16,486	1.39	0.08
	New Cross ..	19,233	4.10	0.21
	Openshaw ..	21,808	6.28	0.29
	St. Mark's ..	20,547	16.57	0.81
SALFORD	St. Michael's ..	17,419	1.65	0.09
	Charlestown ..	14,014	2.38	0.20
	Crescent ..	14,889	3.09	0.20
	Langworthy ..	9,974	6.14	0.60
	Mandley Park ..	13,729	10.36	0.80
	Regent ..	13,583	1.21	0.10
	St. Paul's ..	11,324	4.25	0.40
STRETFORD	Trinity ..	12,043	1.00	0.10
	Park "A" ..	2,975	1.95	0.66
	Stretford ..	11,489	26.97	2.34
	Trafford ..	10,569	28.40	2.70

In only eight of the 51 wards which are covered by this particular survey does the amount of public open space exceed seven acres per thousand persons. In 28 of the wards the figure does not exceed one acre per thousand. [86]

Less than 100 years ago the ratepayers of Manchester as a body did not own a single square yard of land set aside for public enjoyment and recreation. The movement for providing Manchester with open spaces began about 1840, and was taken up enthusiastically by the townspeople. Public appeals were made for financial support for the purchase of a public park and a Bill was piloted through Parliament sanctioning the acquisition of "lands, grounds or special plots either within the borough or at a reasonable distance therefrom, not exceeding five miles from the Town Hall, for the use and enjoyment of the people". The first three parks totalling nearly 100 acres in extent were opened in 1846; these were Philips Park, Queens Park and Peel Park. The latter was subsequently handed over to the Salford Corporation. [87]

The region now possesses many fine open spaces. Heaton Park has an area of 638 acres and contains two golf courses—an eighteen-hole course and a nine-hole course. Wythenshawe Park with 251 acres, and Boggart Hole Clough with 164 acres, are freely planted with trees and shrubs and form ideal picnic grounds for family parties. [88]

Public open spaces throughout the region total some 3,910.5 acres. Nevertheless, there is a serious deficiency according to present-day standards. This figure only represents some 3.02 acres per thousand of the estimated 1938 population. In eight of the 14 districts in the region the figure is below three acres per thousand of the population. [89]

The districts of Urmston and Middleton are well provided for in relation to their present-day populations with figures of 7.31 and 6.81 acres per thousand persons respectively. [90]

Table 1  
EXISTING PUBLIC OPEN SPACE IN THE REGION

Local authority	Population (estimated 1938)	Existing public space (acres)	Open space per 1,000 persons (acres)
Manchester	747,318	2,189.99	2.93
Salford	199,400	456.44	2.29
Eccles	42,550	113.47	2.67
Middleton	29,450	200.56	6.81
Prestwich	32,410	56.50	1.74
Stretford	59,670	207.94	3.48
Swinton and Pendlebury	40,360	151.02	3.74
Audenshaw	11,870	31.50	2.65
Denton	21,090	30.80	1.46
Droylsden	23,710	53.60	2.26
Failsworth	17,370	29.81	1.72
Irlam	14,520	43.99	3.03
Urmston	32,030	234.21	7.31
Worsley	24,920	110.66	4.44
The region	1,296,668	3,910.49	3.02

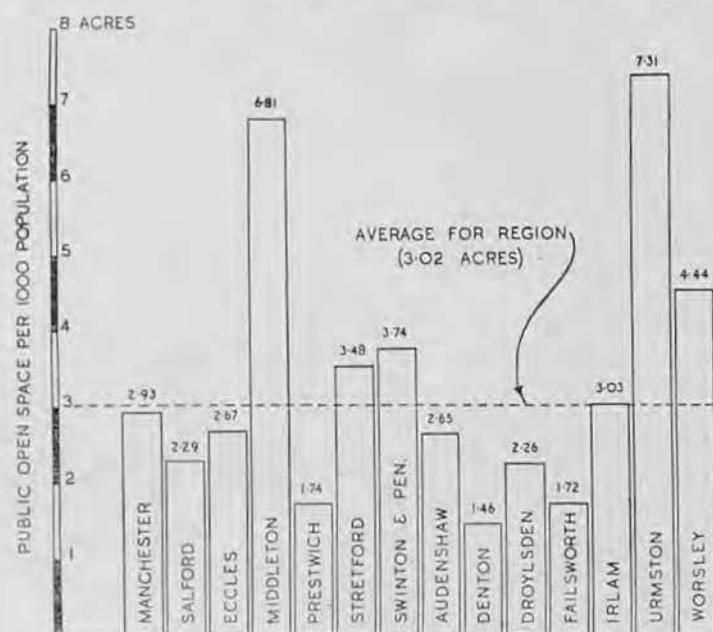


Fig. 9. Amount of existing public open space in each district in terms of acres per thousand population.

### UNDEVELOPED LANDS

For the purpose of ascertaining the development potential of the region, a detailed survey of all open spaces, public and private, and of all undeveloped lands has been made. This survey recorded, in the area of each constituent authority and by reference to a plan and schedule, the following particulars:

*Public open spaces*—position and acreage, each subdivided into areas used for children's playparks, organised games, rest parks, gardens, etc., and park areas which could conveniently be converted into playing-fields if necessary. (This last category includes only those areas which have not been extensively laid out as formal gardens, where levels are suitable for games purposes, and whose sizes would make conversion worth while. It does not include small areas adjoining main traffic routes, or in any positions where their use for games purposes would create a nuisance.) [92]

*Private open spaces*—position and acreage, with present use and whether or not an agreement for retention has been entered into under Section 34 of the Town and Country Planning Act, 1932; whether the areas should be retained either as private open space, or, failing this, as public open space, and whether, if retained, they should be used as children's playparks, playing-fields or rest parks.

*Lands not suitable for development*—position, acreage, present use, and reason for unsuitability. (These are lands subject to flooding, tipped lands which cannot be developed, or which should preferably be reserved from development and for which compensation, if any, would be negligible, and lands for which the provision of public services would be prohibitive.) [94]

*Lands which cannot at present be developed*—position, acreage, present use, and whether recommended for ultimate development or for any particular type of open-space reservation. (These are lands tipped some time ago but still not immediately available for development, lands lacking public services, etc.). [95]

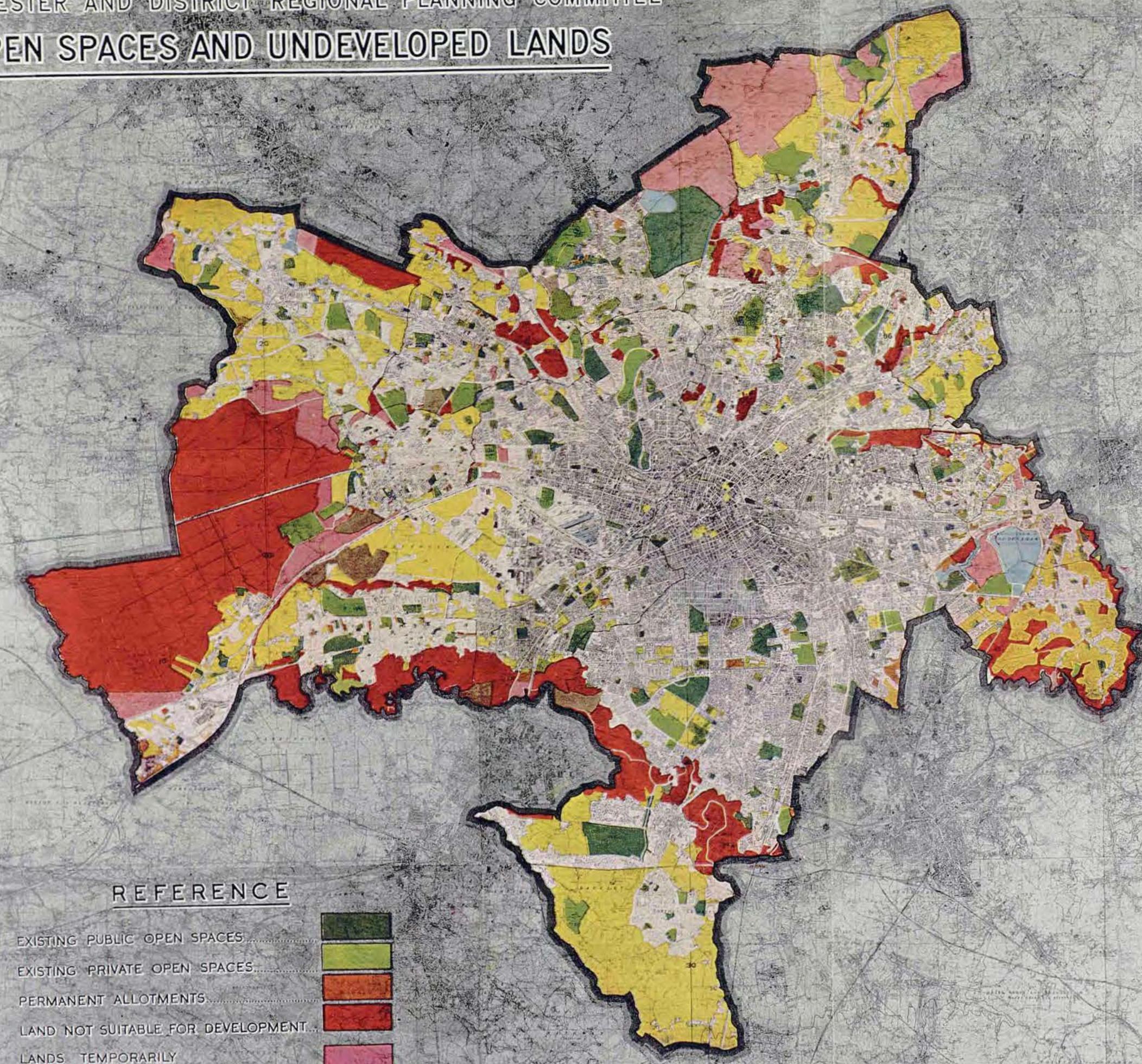
*Existing allotments*—position, acreage, whether permanent or temporary, and whether recommended for retention as permanent allotments. [96]

*Undeveloped lands available for development*—position, acreage, present use, any reasons why land should not be developed (for instance, because it is required and suitable for urgently needed games areas in connection with adjoining development), and other uses for which land might be retained or reserved (e.g., agricultural land under intensive cultivation and woodlands to be preserved as such). [97]

The full appreciation of the position in the region thus obtained has proved invaluable in

MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

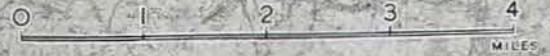
# OPEN SPACES AND UNDEVELOPED LANDS



## REFERENCE

- EXISTING PUBLIC OPEN SPACES
- EXISTING PRIVATE OPEN SPACES
- PERMANENT ALLOTMENTS
- LAND NOT SUITABLE FOR DEVELOPMENT
- LANDS TEMPORARILY RESTRICTED FROM DEVELOPMENT
- UNDEVELOPED LANDS SUITABLE FOR DEVELOPMENT
- SEWAGE WORKS

SCALE





dealing with the residential "overspill" problem (see Chapter IV) and in determining the needs of detailed neighbourhood planning. [98]

## STANDARDS

In considering planning requirements for residential development and redevelopment, it is essential that density standards and standards of open space should be fixed. The former are dealt with fully in Chapter IV. [99]

Since the last war the recommended standard for open space has been increased on a number of occasions; an allocation of seven acres per thousand of the population is now usually accepted. In the United States a standard of ten acres in new development is more generally allowed. [100]

It may be that in the next generation there will be a diminution in working hours, with mechanisation making a contribution in this direction. Open-space requirements may then expand considerably in order that people may be encouraged to take part in physical effort. Shorter working hours must be compensated for by increased facilities for educational and recreational exercises if the nation is to maintain its well-being. [101]

### Children's Playparks

Special play facilities should be provided in the form of small parks catering for the younger children up to 11 years of age, and offering such attractions as sand gardens, paddling-pools and the usual playground apparatus, e.g. swings, slides, etc. The siting of these parks must be carefully designed to ensure convenient proximity to groups of dwellings and safe access, as it is considered that a quarter of a mile is the maximum distance any child should be required to travel, while the crossing of main roads should be avoided. Half an acre per thousand of the population may be regarded as desirable for this purpose, and for easy maintenance each playpark should be not less than two acres in extent. Two playparks, of 2½ acres each, would serve a neighbourhood of 10,000 persons. [102]

### Organised Games

An increased demand for organised-games facilities in municipal parks was experienced in the

years 1919-1939 and it may be expected that this demand will further increase after the war. [103]

It is important that the areas selected should be sufficiently large to enable them to be properly maintained under grass. While it will undoubtedly be an expensive and lengthy process to create grass playing-fields on sites cleared of existing congested houses, such areas must nevertheless be provided if reasonable amenities are ultimately to be secured for the population rehoused by redevelopment. [104]

Table 2 has been prepared for the purpose of estimating the organised-games areas which should be provided per thousand of the population. [105]

The figures for persons per thousand of the population (column 3) have been taken from the estimated 1941 population statistics prepared by the Registrar General. The estimated numbers of persons (column 4) utilising the playing-field facilities are based upon a development of youth organisations after the war, and upon the expectation that such organisations will, as one of their main endeavours, do everything possible to maintain and improve the physique of the coming generation. In addition to the playing-pitches provided for specific purposes, practice areas, some of which might well be asphalted, must be available, particularly for evening use. [106]

The area suggested per thousand persons for tennis courts is based on immediate pre-war use, there having been a substantial falling-off in the use of public tennis courts during the preceding years. The area suggested for bowls is based on a normal provision of bowling-greens (including those owned by private clubs and some public houses). [107]

In areas of new development it is suggested that five acres per thousand persons for children's playparks and organised games should be regarded as a minimum. Where a total public open space of more than seven acres per thousand persons is provided, the organised-games areas might well be extended, wherever levels will reasonably permit, so that more practice areas are available and so that other facilities, such as a miniature golf course, can be accommodated. Where seven acres per thousand persons are provided, the balance will not be found to be extravagant if amenities are to receive their due consideration, natural features fully preserved, and rest parks given the desirable degree of seclusion. [108]

Table 2  
ORGANISED-GAMES AREAS REQUIRED PER THOUSAND PERSONS

Age group (years)	Sex	Persons per 1,000 of pop.	Number using facilities (per 1,000)	Type of use	Area required (acres per pitch)	Number of uses per Saturday	Number provided for per pitch etc.	Population per pitch	Area required per 1,000 persons (acres)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
4-11	Mixed	120	60	<b>CHILDREN'S PLAYPARKS</b> Playgrounds, sandpits, swings, seats for parents, etc. . . . .	40 sq. yds. per child	—	—	—	0.5
12-14	Boys	22	11	<b>ORGANISED GAMES</b>					
12-14	Girls	22	11	Junior football . . . . .	1.25	2	44	4,000	0.31
15-20	Boys	40	10	Junior netball . . . . .	0.25	3	54	5,000	0.05
				Football pitches, with cricket pitches between . . . . .	3.00	2	44	4,400	
				Rugby football pitch . . . . .	3.30	1	30	3,000	
				Hockey pitch, with cricket pitches between . . . . .	2.00	1	22	2,200	1.20*
15-20	Girls	40	8	Hockey pitch . . . . .	2.00	1	22	2,750	1.00*
21-25	Assume half the area required for persons 15-20								1.10*
15-45	Mixed	470	12	Tennis, 6 courts . . . . .	0.17	6	24	2,000	0.09
20-65	Mixed	620	18	Bowls . . . . .	0.60	5	80	4,450	0.12
				Add for trees, approach roads, footpaths, pavilions, etc.					0.63
									4.50
								Total area—Playparks and organised games	5.00 acres

\* Including practice areas and evening use clear of main pitches.

Experience has shown that the maintenance cost of small parks is considerably higher than that of larger areas. For economical maintenance, therefore, in all possible cases, parks and organised-games areas should be grouped together to give a continuous expanse of not less than 20 acres. [109]

In areas which are to be redeveloped it is suggested that a minimum provision of half an acre per thousand of the population for children's playparks and  $2\frac{1}{2}$  acres (about one-half the area suggested in Table 2) for organised games should be made available, making a total of at least three acres per thousand persons for these purposes. The balance of organised-games areas required (two acres) should be provided as conveniently near to the redevelopment areas as possible, and every endeavour should also be made to provide rest-park facilities within reasonable walking or bus-service

distance. Thus throughout the region as a whole a standard of seven acres of public open spaces per thousand persons should be attained. [110]

In passing, it is suggested that in calculating open-space facilities the inclusion of private open-space areas should be considered in detail in all cases. Such open spaces as golf courses, for instance, cannot be regarded as affording usable open space and recreational area for the general benefit of persons living in the vicinity, and many private sports grounds should be regarded in the same way. The degree of benefit to the area surrounding such private open spaces should be assessed in each case, and only a proportion of the private open space corresponding to the local benefit accruing therefrom should be taken into account in calculating the area to be provided as public open space. [111]

The fencing-in of parks and school playing-fields should be avoided in the future. It would, of course, be necessary to educate the general public to appreciate and respect them. The provision of more open spaces would, in itself, help to protect them in that no individual park would be likely to be used excessively. [112]

Ornamental parks are normally small areas intended as restful and decorative features of neighbourhood development. They should be sited away from the noise of traffic and may form suitable settings to community or public buildings. [113]

The Regional Planning Committee has given consideration to the open-space standards which should apply in the regional planning area and has approved in principle the recommendations outlined above. [114]

### GREEN BELT

Open-space requirements of a local character, i.e., children's playparks, ornamental parks, etc., will be dealt with as aspects of detailed local planning. In regard to major reservations it has been necessary to give earnest consideration to the problem of securing adequate breaks between the larger developed areas in the Greater Manchester conurbation. [115]

This matter was first brought up in 1938 when Mr. G. L. Pepler, then Chief Town Planning Inspector to the Ministry of Health, informed the South Lancashire and North Cheshire Advisory Planning Committee (then the Manchester and District Joint Town Planning Advisory Committee) that, in view of planning proposals which had been submitted to the Ministry by certain planning authorities in the Manchester area, he would like to have an opportunity of discussing with representatives of the Advisory Committee the desirability of formulating proposals for the provision of a green belt in and around Manchester and district. [116]

The chairman and deputy chairman of the Advisory Committee, accompanied by the honorary secretary, accordingly met Mr. Pepler on the 16th December, 1938, and as a result the Ministry decided to convene a conference of representatives of the county councils of Lancashire, Cheshire and Derbyshire, and of the Advisory Committee, for the purpose of ascertaining how far the question of providing a green belt had been considered by the

various authorities, and, secondly, whether some procedure could be devised for exploring the matter further with the object of producing a definite scheme. [117]

This conference was held in the Town Hall, Manchester, on the 15th February, 1939, and after a discussion it was decided to constitute an informal technical committee to examine the position and present a report to a future meeting of the conference upon the desirability of formulating proposals for a green-belt scheme. It was further decided that the technical committee should meet under the chairmanship of one of the Minister of Health's town planning inspectors, Mr. P. J. Williams. [118]

The Technical Committee comprised representatives of the surveyors to the county councils of Cheshire, Derbyshire and Lancashire, members of the Surveyors' Sub-Committee of the Advisory Committee, together with the surveyors of certain planning authorities not associated with the Advisory Committee, and in addition, the surveyor to the Peak Joint Planning Committee. [119]

Before the outbreak of war the Technical Committee obtained much information (based upon the planning proposals then in existence) in relation to land and building uses in the area and in April, 1939, after considering the questions involved, they decided that the work could best be undertaken by a small sub-committee. The Technical Committee accordingly set up a sub-committee, consisting of its chairman and the county surveyors or planning officers for the counties of Cheshire, Derbyshire and Lancashire, to examine the position disclosed by the user map in each regional area, to confer with the surveyors to the respective regional planning committees, and to report their conclusions to the Technical Committee. [120]

Upon the outbreak of war, deliberations were for a time suspended, but in 1940 work was resumed, and in November, 1943, an interim report and a plan of the green-belt proposals were submitted to the Technical Committee, indicating lands which should be considered for inclusion in the scheme (Plate 8, facing page 22). [121]

The sub-committee was influenced in formulating its proposals by the following considerations:

- (a) The necessity largely to confine the areas selected to undeveloped lands not provided with public services.

- (b) The desirability, as far as practicable, of providing for reasonable extensions of existing communities, and
- (c) The desirability of dividing, as far as possible, by breaks of open space the built-up areas of existing communities. [122]

The plan was submitted to the Technical Committee with the following observations or reservations, viz:

- (a) In preparing the scheme, local-government or any other artificial boundaries have been disregarded.
- (b) No consideration has been given to any question of policy which may arise as a result of the formulation of a green-belt scheme upon the basis of the plan; on the contrary the sub-committee considered the matter purely as planning officers from a strictly technical point of view.
- (c) The plan is likely to require amendment as a result of national planning policy; in this respect the Government has not yet indicated what lines national policy is to follow, but it is clear that when the lines of such policy are known the plan now submitted will need to be reviewed and amendments will probably be necessary, for obviously the dispersal of housing or industry and the reservation of agricultural areas are bound to affect any proposals for a green-belt scheme; and
- (d) Quite apart from the question of national planning policy, planning authorities are now reviewing their pre-war proposals, and therefore, in addition to any amendments which may be necessary as a result of national policy, some further revision may be necessary as a result of the reviews now being made by planning authorities themselves. [123]

The proposals of the Technical Committee have been considered by the Surveyors' Sub-Committee in respect of the Manchester region, and in the light of detailed local knowledge amendments have been made (Plate 9, facing page 23). The area reserved for green-belt purposes amounts to approximately 20,000 acres. [124]

In the case of Middleton, the most northerly district in the region, the Borough Council has approved in principle the provision of an extensive

agricultural belt surrounding the urban area. The development scheme proposed provides for the limitation of the town to an ultimate population of 60,000 persons (estimated population in 1938: 29,450). Future development will be limited roughly to an area bounded by a circle having a radius of  $1\frac{1}{4}$  miles from the town centre. The outer area will then form an extensive agricultural belt linking up with the undeveloped lands in the north-east part of Prestwich and beyond, and with Heaton Park in Manchester, so providing a substantial break between the region and the industrial towns to the north (i.e. Rochdale, Heywood and Bury). [125]

The mosslands to the west of the region form a natural barrier to development and enable the districts of Irlam and Worsley to retain their respective identities. [126]

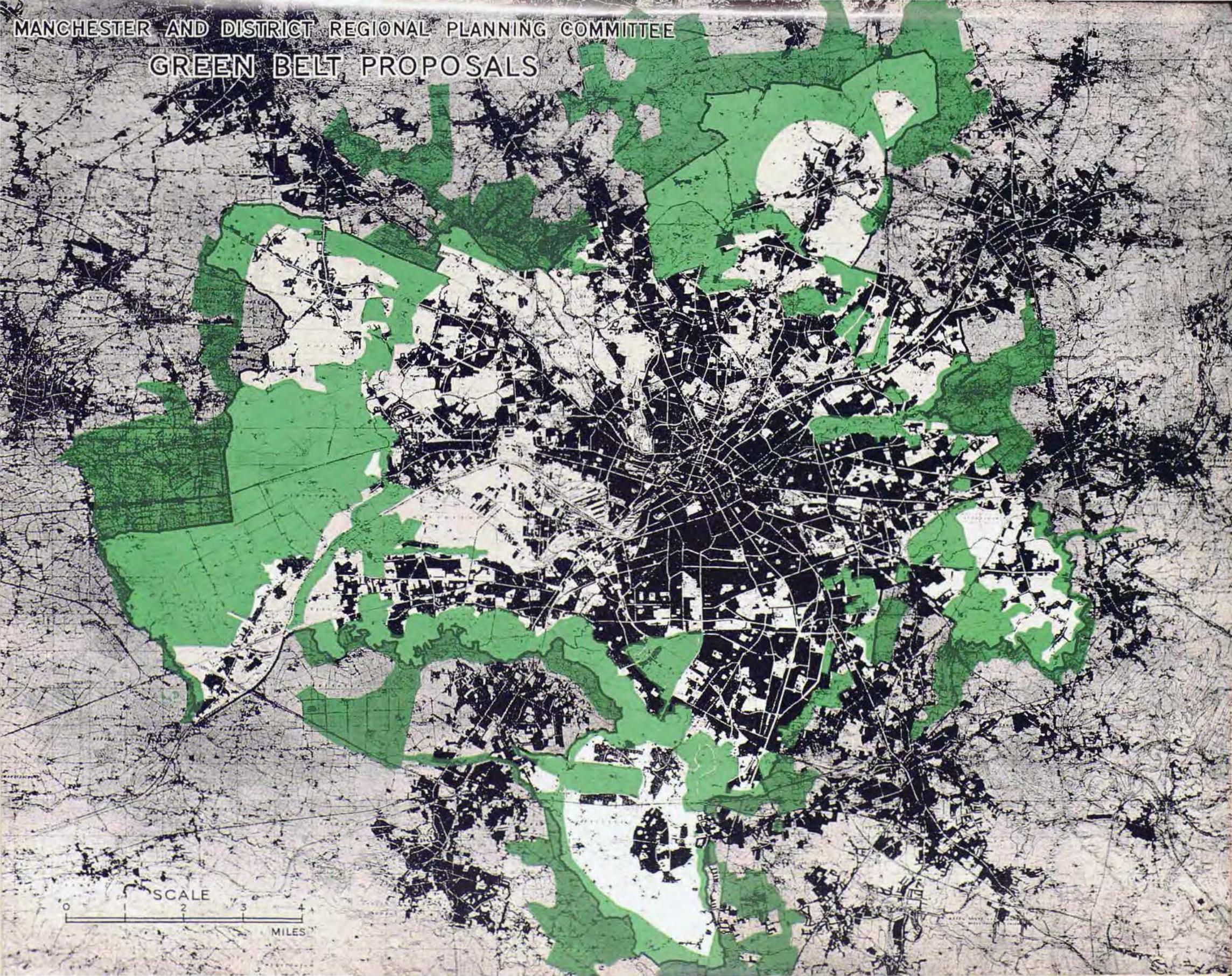
Worsley is particularly fortunate in that it is possible to secure adequate breaks with the boroughs of Eccles and Swinton and Pendlebury to the east, and with Farnworth and Kearsley to the north. This district also possesses some fine belts of woodland; every effort should be made to preserve them. [127]

To the south of the region, the low-lying lands adjoining the River Mersey are a natural check to development. These at present provide good recreational areas (i.e., golf courses and playing-fields) and amenities in the form of riverside walks. As it is anticipated that the condition of the River Mersey will continue to improve, there should be no doubts as to its amenity value in the future. [128]

The planning of existing development at Wythenshawe has been more progressive than that of comparable developments carried out at the same time, and has been regarded in informed quarters as an outstanding example of municipal achievement. The proposed further development will continue to provide ample open-space facilities. To the south and south-west of the estate, a very substantial area of land will, no doubt, be reserved for Ringway Airport and will remain open except for the provision of airport buildings. [129]

The south-east part of the region, adjoining the Heaton Norris district of Stockport, has been extensively developed in comparatively recent years, and, except as a very long-term policy an adequate break cannot be achieved. There are fortunately three fairly substantial areas of open land immediately adjoining the regional boundary

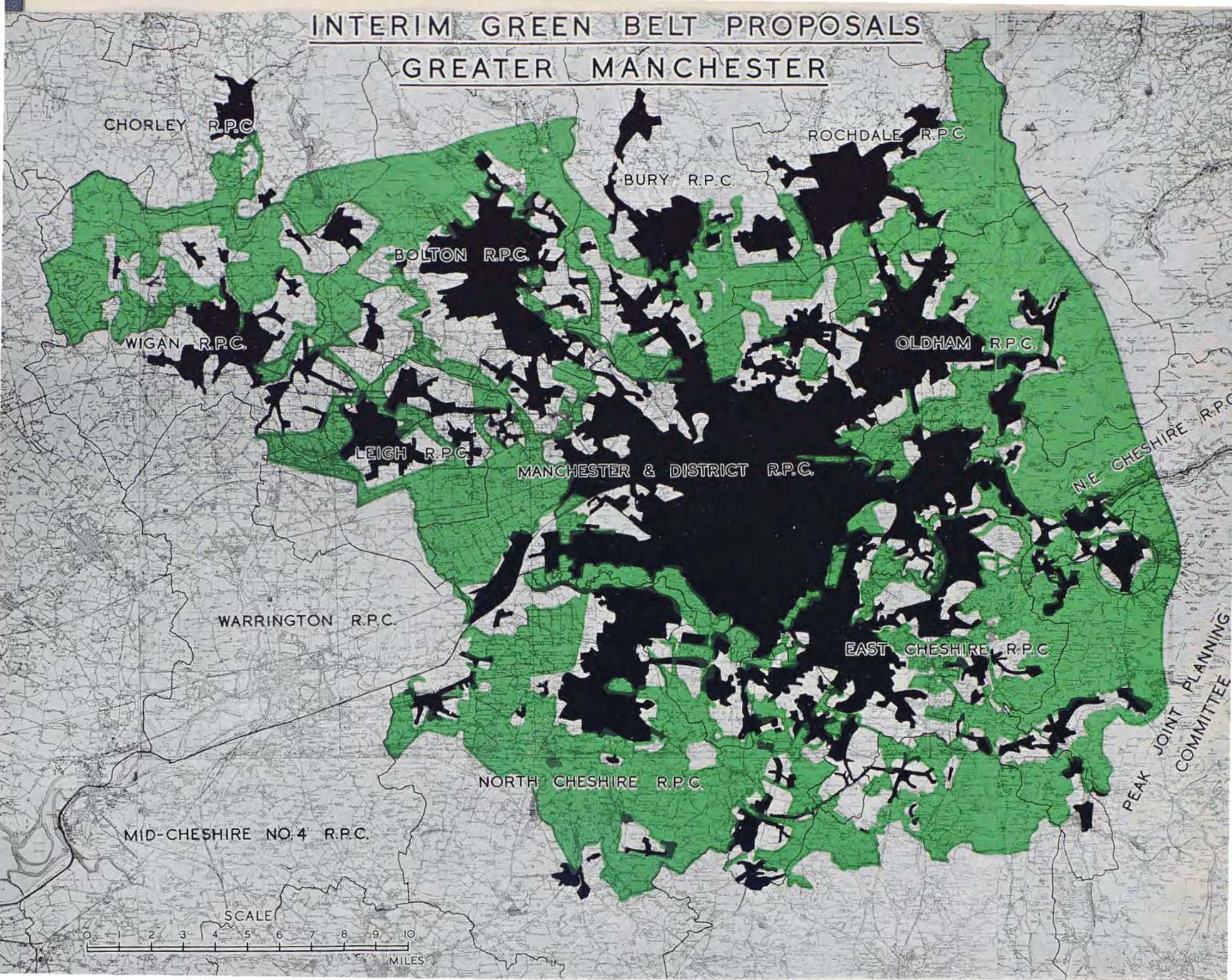
MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE  
GREEN BELT PROPOSALS



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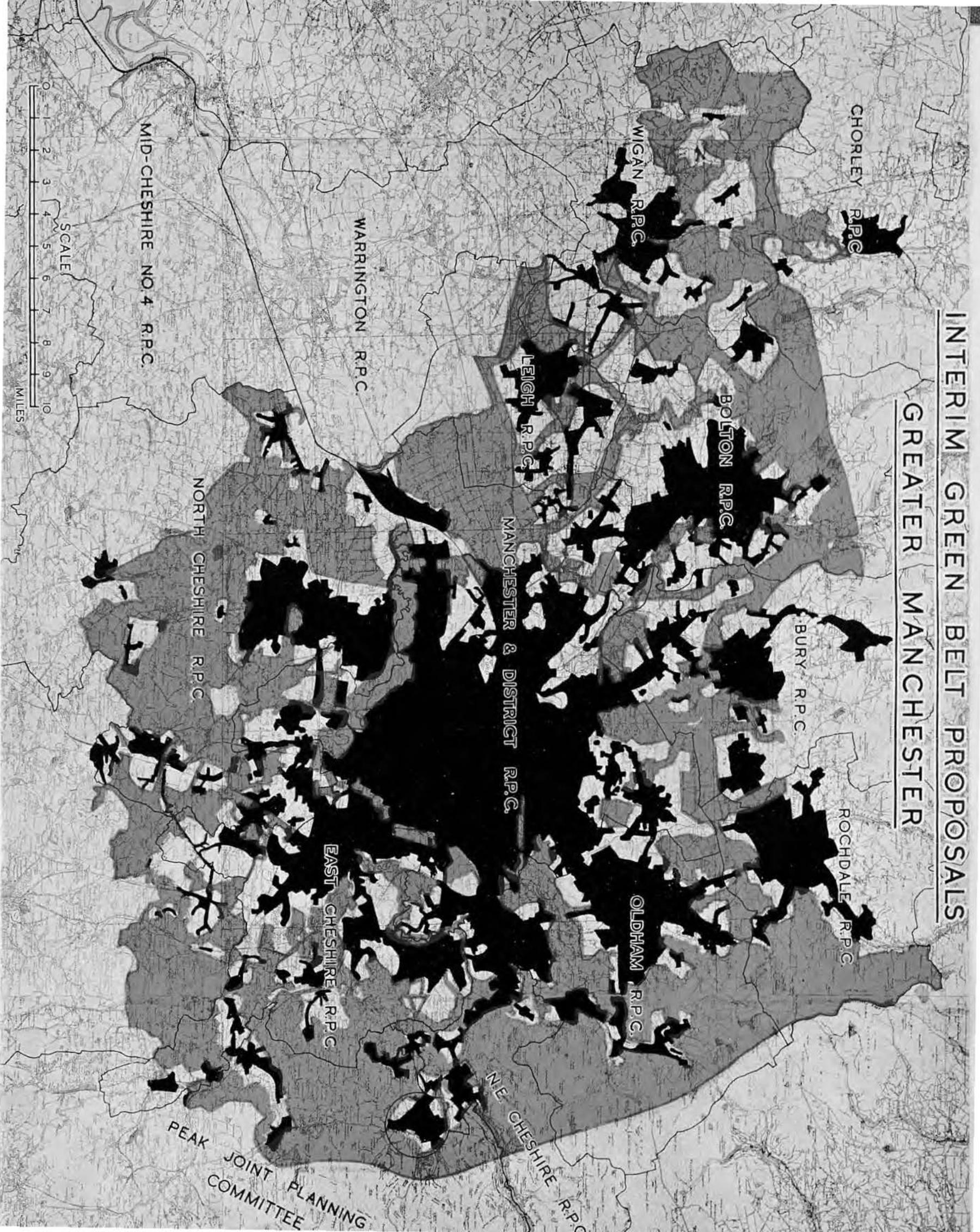
# INTERIM GREEN BELT PROPOSALS

## GREATER MANCHESTER



# INTERIM GREEN BELT PROPOSALS

## GREATER MANCHESTER



with the East Cheshire planning area which should form part of the major green-belt scheme. [130]

To the east, Denton is fortunate in having substantial areas of undeveloped land within its boundaries, while the valley of the River Tame forms a natural boundary between Denton and Hyde. [131]

Generally, the reservation of these regional green-belt areas will form substantial breaks between the region and adjoining built-up areas. In addition, it will be possible by the judicious planning of detailed neighbourhood-unit development to provide wedges of open space in the inner areas. [132]

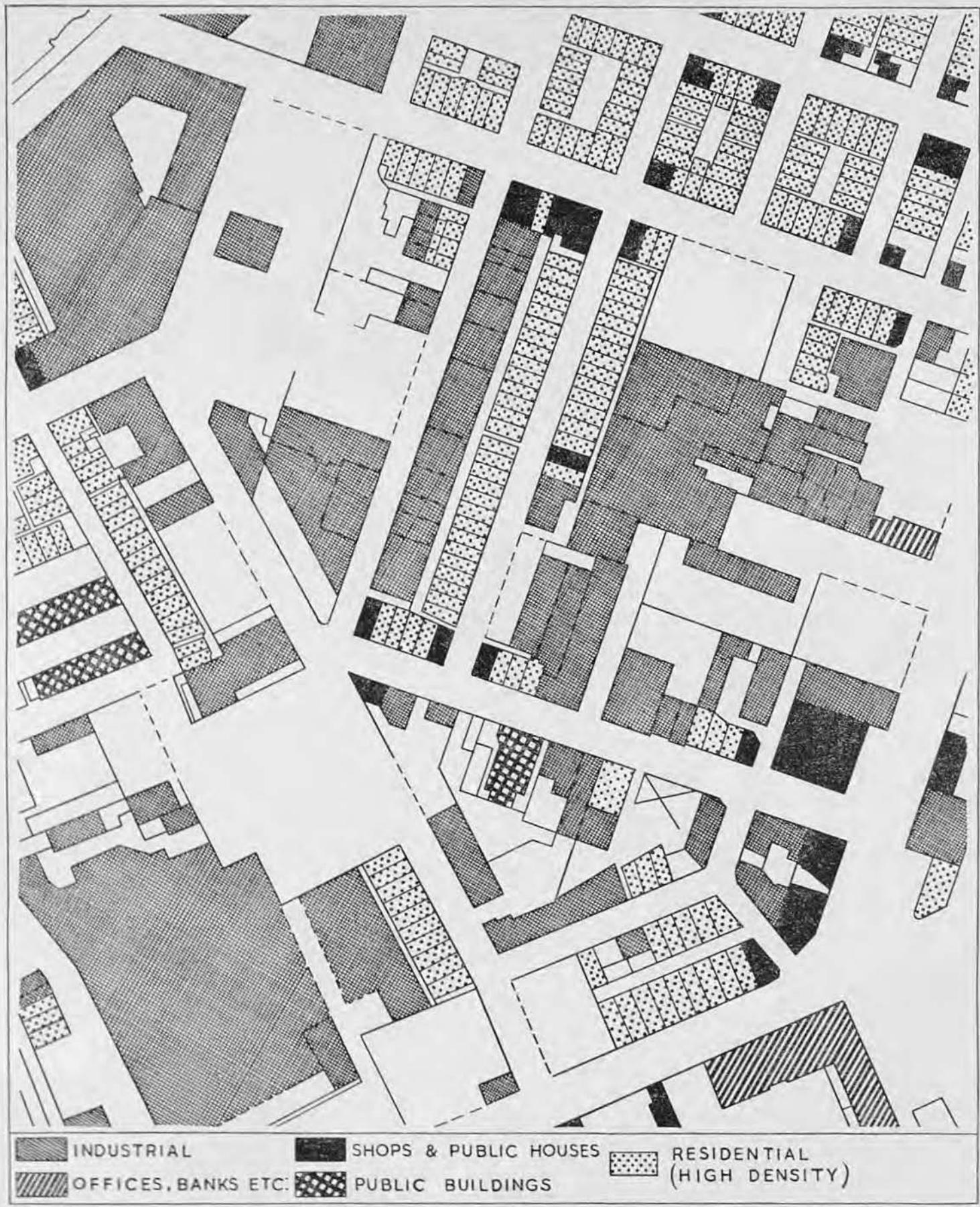


Fig. 10. Typical mixed development showing high-density dwellings intermingled with industry.

# IV

# HOUSING

"The last quarter of a century has seen a steady rise in the general standard of living and a growing desire and appreciation of good housing . . . We expect this tendency to continue after the war . . . Housing will be expected to keep abreast of progress in these fields."

(*"Design of Dwellings"*, Ministry of Health, 1944)

## RESIDENTIAL CONGESTION

THE REGION shares with the industrial north the legacy of residential and industrial congestion left by the era of expansion in the early nineteenth century. In the inner residential areas are mean streets—overcrowded dwellings devoid of sunlight and lacking open-space amenities—all typical of the Lancashire industrial towns. [133]

Of the 363,558 dwellings in the region, 219,860 exceed a density of 18 per acre, and 191,393 exceed 24 per acre. That the position can be so bad will be understood when it is realised that in Manchester, for instance, the first building byelaws came into operation in 1868, not more than 77 years ago. These byelaws required only 70 square feet of open space in the rear of dwellings and permitted back passages not more than five feet wide. The ground floors of houses were then usually flagged;

damp-courses were not provided, and the walls were thin and porous. The city at that time contained no less than 60,000 open cesspools which overflowed into the sewers. There were no public baths, hospitals or means of disinfection. [134]

The 1890 byelaws increased the rear open-space requirement to 150 square feet, permitting development at a density of approximately 40 houses to the acre. The 1908 byelaws further increased this space to 250 square feet, but even then long rows of narrow-fronted houses—without gardens and generally without baths—were built, until in 1914 town-planning restrictions imposed a very definite and substantial improvement in further developments. [135]

A survey of the inner area of the region (Manchester, Salford and Stretford) reveals that in only 14 of the 51 wards making up these towns is the

Table 1  
RESIDENTIAL CONGESTION—INNER AREAS

Authority	Ward	Number of dwellings	Acreage of residential development	Average density (dwellings per acre)	Number of dwellings exceeding 30 per acre	Number of dwellings exceeding 42 per acre
Manchester . . .	Ardwick . . .	5,546	130	43	5,229	3,949
	Beswick . . .	6,769	162	42	6,769	6,138
	Miles Platting . . .	4,810	108	45	4,461	2,744
	New Cross . . .	4,505	111	41	4,086	2,440
	St. George's . . .	5,977	135	44	5,961	4,746
	St. Michael's . . .	3,559	75	47	3,531	3,214
Salford . . .	Ordsall Park . . .	3,626	76	48	3,504	3,139
	Regent . . .	3,275	81	40	3,094	2,048
	St. Paul's . . .	3,038	68	45	2,776	2,321
Stretford . . .	Clifford Park A. . .	2,046	73	28	1,624	—
		737	21	35	737	—

average density of residential development 16 houses to the acre or under. Manchester, in particular, conforms to the pattern of most large industrial towns, possessing:

- (1) a central area—now mainly given up to commercial and business use,
- (2) a surrounding ring of mixed industrial and residential development—the latter at high density, and
- (3) outer areas of suburban residential development at comparatively low densities. [136]

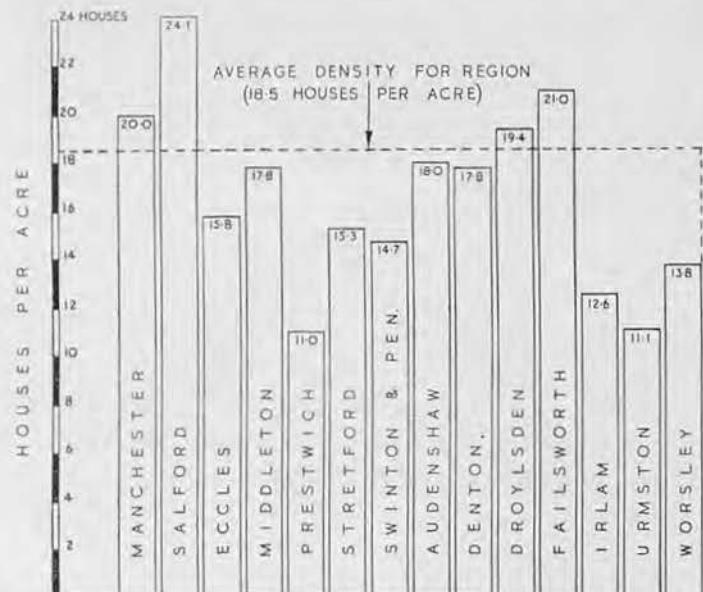


Fig. 11. Average density of residential development in the regional area.

Table 1, by reference to certain wards, clearly indicates the residential congestion prevailing in the inner areas. [137]

A residential survey of the region shows that:

- (a) 52 per cent of existing dwellings exceed a density of 24 to the acre,
- (b) 43 per cent exceed 30 to the acre, and
- (c) 17 per cent exceed 42 to the acre. [138]

Of the 63,019 houses in the latter category, 41,589 are in Manchester and 19,792 in Salford. [139]

Table 2 indicates the extent of the redevelopment problem. [140]

## ADEQUATE RESIDENTIAL STANDARDS

Before the planning requirements for residential development and redevelopment could be considered it has been necessary to determine density standards which would provide the minimum facilities now regarded as essential for:

- (a) the proper siting of residential buildings in relation to one another so that architectural and health requirements, in regard to setting and the provision of essential light and air, might be secured, and
- (b) the provision of adequate organised-games areas, children's playgrounds, rest parks, and school playing-fields (see Chapter III). [141]

In the past, the problem of redeveloping congested residential areas has nearly always been

Table 2 DENSITIES OF RESIDENTIAL DEVELOPMENT

District	Number of dwellings	Area of residential development (acres)	Average density (dwellings per acre)	Number of houses under 18 per acre	Number of houses over 18 per acre	Number of houses over 24 per acre	Number of houses over 30 per acre	Number of houses over 42 per acre
Manchester .. .. ..	202,289	10,141	20.0	71,114	131,175	121,112	101,563	41,589
Salford .. .. ..	51,721	2,143	24.1	9,623	42,098	39,655	35,544	19,792
Eccles .. .. ..	12,693	803	15.8	5,291	7,402	5,126	3,494	697
Middleton .. .. ..	9,649	542	17.8	3,408	6,241	5,186	3,263	221
Prestwich .. .. ..	9,899	901	11.0	8,114	1,785	—	—	—
Stretford .. .. ..	17,029	1,109	15.3	8,791	8,238	4,739	3,628	—
Swinton and Pendlebury ..	12,229	830	14.7	6,840	5,389	4,007	978	254
Audenshaw .. .. ..	3,902	217	18.0	2,476	1,426	1,426	1,426	—
Denton .. .. ..	7,789	438	17.8	3,973	3,811	2,735	1,521	298
Droylsden .. .. ..	7,839	404	19.4	4,768	3,071	2,673	1,985	200
Failsworth .. .. ..	5,543	264	21.0	1,652	3,891	2,819	1,028	—
Irlam .. .. ..	4,078	324	12.6	3,929	149	149	26	—
Urmston .. .. ..	11,146	1,000	11.1	9,373	1,773	1,008	497	58
Worsley .. .. ..	7,752	561	13.8	4,341	3,411	758	168	—
The region .. .. ..	363,558	19,677	18.5	143,698	219,860	191,393	155,121	63,109

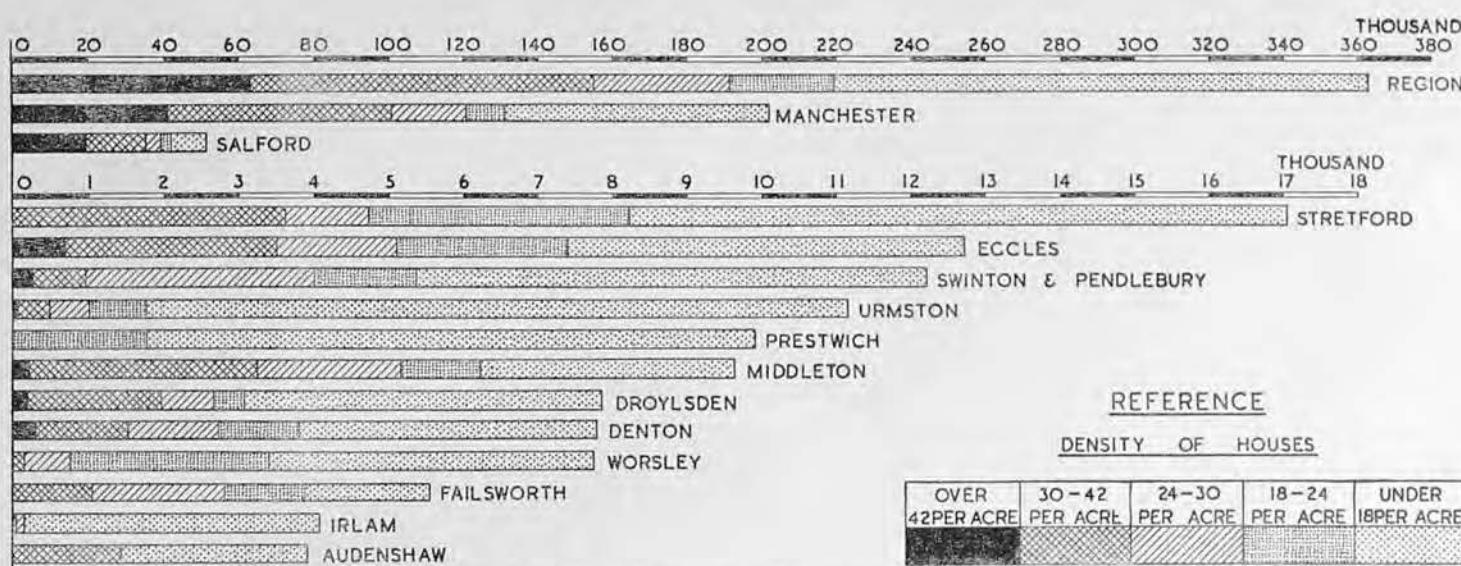


Fig. 12. Diagram indicating the number of dwellings in the region, together with the densities of development in each local authority area.

considered with a view to re-establishing as large a number of people on each redevelopment site as possible. Each redevelopment scheme has been treated as a separate unit without any correlation between it and the planning of open spaces and community facilities. [142]

In 1918, the Tudor Walter's Report recommended a minimum distance between houses in parallel of 70 feet; as will be seen later, from a health view alone this should not be reduced. Houses complying with this minimum standard, and providing adequate room sizes and three-bedroom accommodation, will not permit development at a density exceeding 16 to the acre; even then the development will be mainly in the form of terraces with only occasional breaks for air circulation. There will be little room for what may be called the softening influences, i.e., the preservation or provision of trees in positions where they will not completely overshadow windows or seriously affect the cultivation of back gardens. At this density the essential privacy and amenity of a small garden or "outdoor room" will be obtained; the average back garden will be only about 85 square yards in area, which, including yard space for dustbin, etc., can only be regarded as the smallest area worth classifying as a garden. While such a density may be accepted in the redevelopment of congested residential areas, it cannot be regarded as suitable in new development. [143]

An inspection of well-planned inter-war development at 12 houses to the acre is sufficient to

establish that really pleasurable living conditions can only be obtained at this density or less. Many of our housing schemes at this density appear wasteful in the use of land because they lack the softening amenities provided by trees and hedges, breaks in building lines, green squares and other relieving features; their barren appearance is due to lack of imagination in design and to poor layout and landscape treatment. [144]

### Siting

The diagrams in this chapter have been prepared for the purpose of obtaining theoretical densities. Obviously, if the principles upon which any of the plans are based were applied to a particular development or redevelopment area there would be variations in the density obtained, caused by the siting of return streets, the boundaries of the area, levels, position of existing trunk services, and the preservation of natural amenities, etc. [145]

### Houses

In determining development and redevelopment density standards the following considerations have been taken into account:

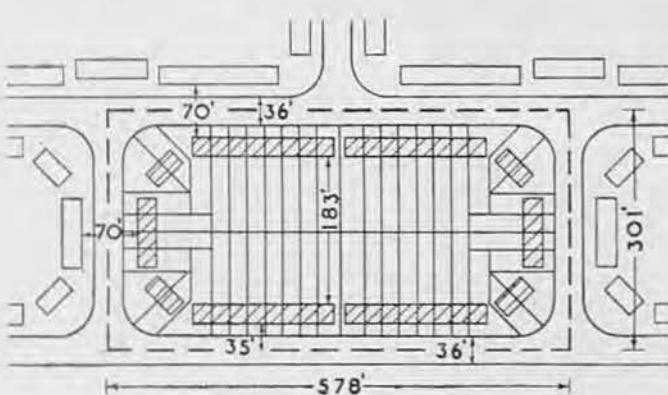
- The typical houses have been taken as having a gross ground-floor area of 528 square feet (22 feet wide by 24 feet deep).
- They have been placed as far as possible in blocks of eight with through passages between each pair of houses. (The alternative to this provision is back secondary streets,

which cannot be regarded as desirable or economical.)

(c) Return streets have been taken at intervals of approximately 500 feet purely to give a proportion of street area likely to be comparable with average development conditions. [146]

The above provisions cannot be regarded as extravagant. In fact they can be accepted as providing compact development giving a high density when the distance between parallel rows approaches the minimum of 70 feet. [147]

#### A HOUSES DENSITY 12 PER ACRE.



#### B HOUSES 70 FEET BETWEEN REAR OF BUILDINGS. DENSITY 16.6 PER ACRE.

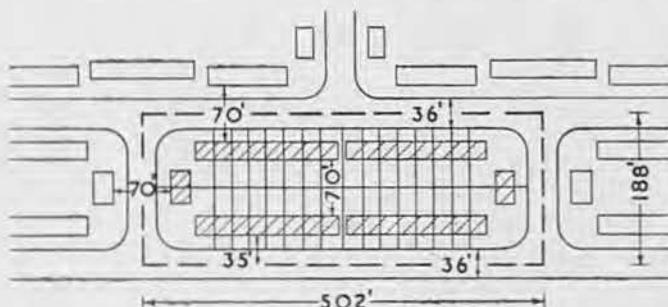


Fig. 13. Housing densities

Fig. 13A shows a typical layout at a density of 12 houses to the acre with a minimum distance between building lines of 70 feet. The backs of the houses are screened by corner blocks of semi-detached houses—this could be completed effectively by walling, incorporating garden doorways between such houses and those adjoining. The distance between the backs of opposite buildings is 183 feet while the average open space per house,

excluding streets, is 265 square yards. With semi-detached houses—eight feet between pairs—the distance between the backs of opposite buildings would be about 150 feet; with a provision for garage access—say 16 feet between pairs—this distance would be about 120 feet. [148]

Fig. 13B shows a redevelopment layout with 70 feet between the backs of buildings. The average open space per house, excluding streets, is 127 square yards. The density, including one-half of abutting streets, is 16.6 houses per acre. Taking into account the layout of existing streets in redevelopment areas, it will be found no easy task to attain a net redevelopment density of 16 houses per acre. The use of loop roads, culs-de-sac, squares and quadrangles would interrupt continuity and thereby further reduce density. [149]

#### Flats

In the layout for blocks of flats indicated in Fig. 14 the following provisions have been incorporated:

- (a) The floor of each flat, including walling and recessed balconies, has been taken for all aspects as 35 feet 10 inches in width, by 28 feet 10 inches in depth; a gross area of 1,033 square feet.
- (b) The flats have been placed in blocks—eight flats per floor—in parallel rows at right-angles to the traffic roads serving them, with access for tradesmen, refuse collectors, etc., provided by single-carriageway service roads with standing bays at intervals. The ordinary traffic roads have been placed at the intervals shown purely to give a proportion of street area likely to be comparable with average redevelopment conditions.
- (c) The height has been taken as three storeys and the blocks have been spaced at three times their height (to top of parapet) apart.
- (d) The ends of adjoining blocks have been placed at a distance equal to half their height apart, securing adequate air circulation and a break in continuity. Closed and open courts have been regarded as undesirable from the point of view of natural light, sunshine and through ventilation. (Some returns, however, would be required where architectural treatment and site conditions so necessitate.)

(e) The distance between building lines in the traffic streets has been taken as 70 feet. [150]  
The density is 30.77 flats per acre. [151]

## FLATS - 3 STOREY

DENSITY 30.77 PER ACRE.

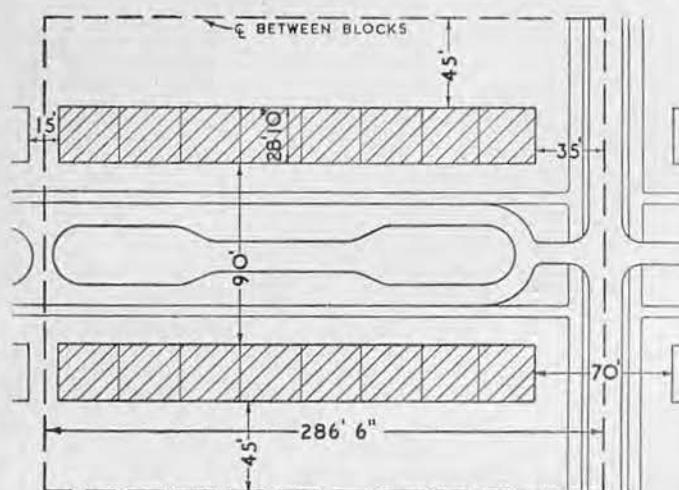


Fig. 14. Density of flats—three times their height apart.

Table 3 NET DENSITIES

Fig. no.	Type of development	Net density (including half width of surrounding roads)	Distance between fronts of opposite buildings (feet)	Distance between backs of opposite dwellings (feet)
13A	Houses 12 per acre	12.00	70	183
13B	Houses 70 feet between rows	16.60	70	70
14	Three-storey flats, three times their height apart ..	30.77	90	90

## Daylighting and Sunlight

It has been regarded as essential that houses and flats should satisfy the natural lighting conditions recommended in "Lighting of Buildings" (Post-War Studies No. 12), published by the Ministry of Works, and set out in Table 4. [152]

The following notes explain the terms used in the Table.

The daylight factor is the measure of daylight at a point indoors and is defined as "a percentage of the total light available outdoors under the unobstructed sky". Thus, a factor of one per cent signifies that at the point in question the illumination is one per cent of that which would be obtained if from that point the whole hemisphere of sky could be seen. Measurements are usually taken on a working-plane 2 feet 9 inches above the floor.

The daylight penetration is the horizontal distance at the working-plane level from the vertical centre line of the window to the limit of the daylight area.

The daylight area for a particular daylight factor is that area in a room within which the intensity of illumination at least equals this daylight factor. [153]

Table 4  
MINIMUM DAYLIGHT STANDARDS

Room	Size (square feet)	Daylight factor (percentage)	Penetration (feet)	Daylight area (square feet)
Working kitchens and sculleries	Up to 100	2	6	50
	101 to 120	2	7	60
Living-rooms ..	Up to 150	1	8	80
	151 to 200	1	10	100
Bedrooms ..	Up to 110	0.5	8	60
	111 to 150	0.5	10	90
	151 to 200	0.5	12	120

Table 5 sets out the daylight factors for kitchens and living-rooms (at penetration distances of 6 feet and 10 feet respectively) in respect of dwellings spaced at various distances apart. [154]

It will be seen that the daylight in the kitchen complies with the recommended standard when the houses are 70 feet apart, but the importance of window width in the living-room is indicated by the difference between the daylight factors obtained from widths of 6 feet 6½ inches and 8 feet 2½ inches. Even with the wider window the lighting standard is not attained, but provided the room is not deep a satisfactory daylight area is secured. [155]

In three-storey flats, even where they are spaced three times their height apart and where the ground-floor height is increased to 8½ feet, the daylight standard in the living-room on the ground floor is also not quite satisfied. Where they are only twice their height apart a very serious deterioration in lighting conditions is indicated. [156]

Of almost equal importance is the extent to which each block of buildings is directly exposed to the sun's rays, for not only do these brighten the rooms into which they penetrate, but they also dry and warm the buildings themselves and improve the fertility of surrounding ground. [157]

Table 6 shows the hours of sunshine which are obtained with buildings at varying distances apart at different periods of the year. The figures given are for parallel rows of dwellings. [158]

The Table shows the effect of reducing the distance between houses from 70 feet to 60 feet.

Table 5  
DAYLIGHTING IN BUILDINGS

Type of dwelling	Distance apart (feet)	Kitchen		Living-room	
		Width of window	Daylight factor (penetration 6 feet)	Width of window	Daylight factor (penetration 10 feet)
Houses	70	ft. in. 4 10½	2.10	ft. in. 6 6½ 8 2½	0.68 0.83
	60	4 10½	1.95	6 6½ 8 2½	0.58 0.70
	50	4 10½	1.85	6 6½ 8 2½	0.44 0.52
Three-storey flats:					
Ground floor	90	4 10½	1.81	8 2½	0.65
(ceiling height 8 ft.)	(three times their height)				
Ground floor	91½	4 10½	2.21	8 2½	0.89
(ceiling height 8 ft. 6 in.)	(three times their height)				
Ground floor	60	4 10½	1.30	8 2½	0.16
(ceiling height 8 ft.)	(twice their height)				

Table 6  
HOURS OF SUNSHINE  
(Latitude 53°—Stoke-on-Trent)

Description	Net density	December 22			March 1 to September 23		June 21	
		Front aspect			Front aspect		Front aspect	
		North	South	East or West	North or South	East or West	North or South	East or West
Terrace houses 12 to the acre—distance apart: 75 ft. at front; 149 ft. at rear	12	5.0	Nil	5.25	10.0	9.75	14.0	13.5
Terrace houses 70 ft. apart	17.67	Nil	Nil	5.0	10.0	9.0	13.75	13.25
Terrace houses 60 ft. apart	22.14	Nil	Nil	4.5	10.0	8.0	14.0	12.0
Three-storey flats (three times their height apart)	30.77	Nil	Nil	4.5	10.0	9.0	14.0	13.0
Three-storey flats (twice their height apart)	41.37	Nil	Nil	4.0	10.0	8.0	14.0	12.25
Ten-storey maisonettes (three times their height apart)	25.5	Nil	Nil	4.5	10.0	8.5	14.0	12.5
Ten-storey maisonettes (twice their height apart)	36.87	Nil	Nil	3.5	10.0	7.0	13.5	10.75

Note.—Height of houses for Tables 5 and 6 = 26 ft. 3 in. to ridge.

Height of flats = 30 ft. to top of parapet.

Hours of sunshine calculated at a working plane 2 ft. 9 in. above ground floor or 3 ft. 9 in. above ground.



1



2



3



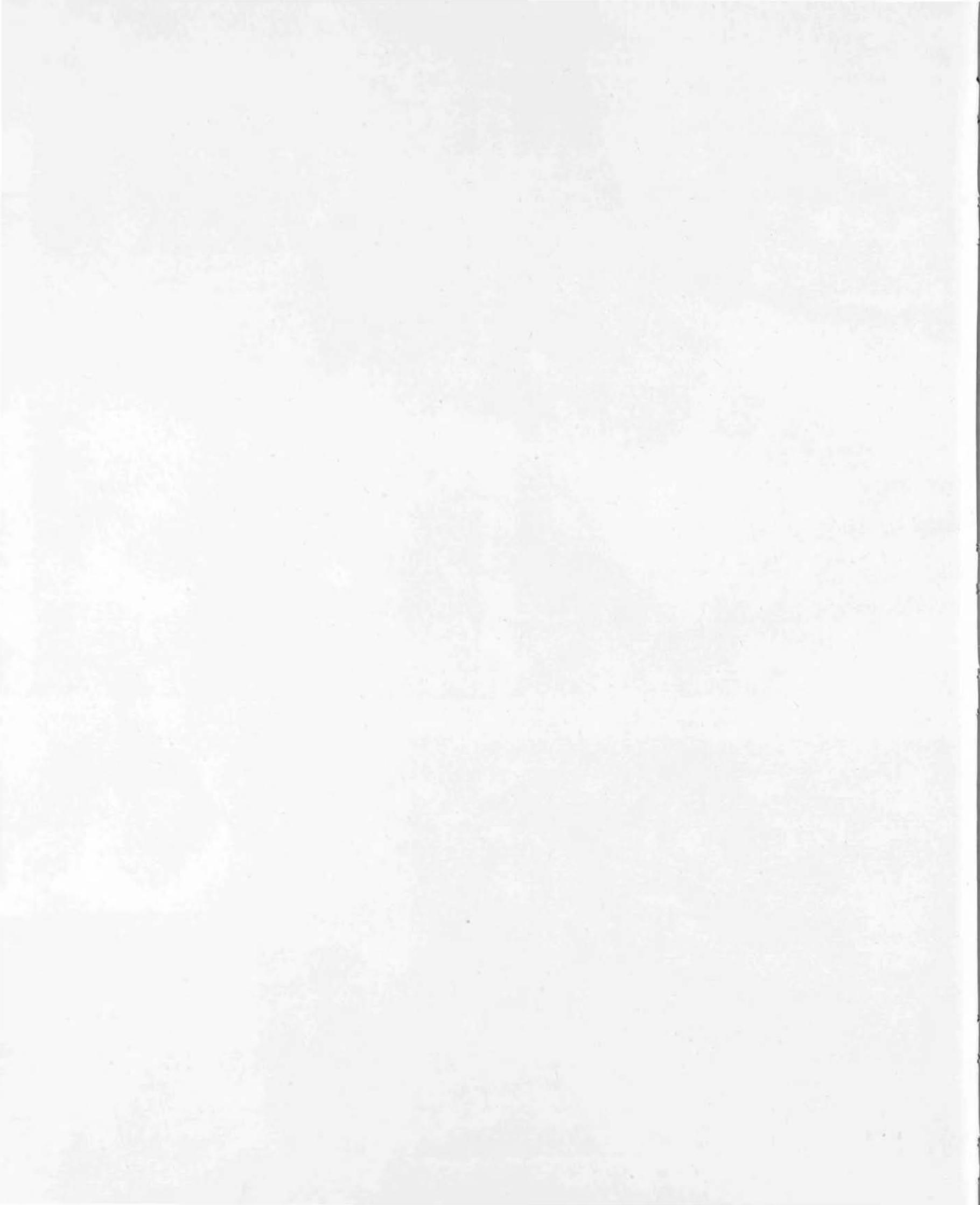
4



5

#### TYPES OF EARLY DEVELOPMENT

1. Pre-1830—close development
2. 1870
3. 1890-1900
4. 1910-1920
5. Congested residential development



Three-storey blocks of flats three times their height apart obtain reasonable sun lighting, as do ten-storey maisonettes at a similar spacing. At twice their height apart the deterioration is considerable, being about 22 per cent in the case of high blocks. With east and west aspects, sunshine is obtained in front and back rooms and on the ground at both sides. It is particularly important that such orientation (i.e., the direction in which buildings face) should be obtained in tall buildings so that no land shall be permanently devoid of sunlight and thereby remain damp and less fertile. [159]

## APPROVED STANDARDS

The Regional Planning Committee has approved in principle the following standards for residential development and redevelopment:

### (a) Houses in redevelopment areas

The minimum distance between houses placed in parallel shall be not less than 70 feet and the density not greater than 16 houses per acre. [160]

### (b) Houses in new development areas

The minimum distance between parallel rows of houses shall be not less than 70 feet and the density not generally greater than 12 houses per acre, thereby permitting the provision of desirable breaks in building lines, the architectural grouping of houses in courts and culs-de-sac, etc., the architectural treatment of corner buildings, the preservation of natural amenities (spinneys, groups of trees, individual trees, etc.), and the provision of such additional amenities as may be necessary to create interest. [161]

### (c) Flats in redevelopment areas

The distance between blocks of flats shall be not less than three times their height and the number of flats per acre shall not exceed 30 (based upon three-bedroom accommodation), thereby securing approximately the same natural lighting conditions in the ground floor as will be obtained in dwelling-houses placed 70 feet apart. [162]

### (d) Flats in new development areas

The number of flats shall be graded according to the density zone on the basis that in a 12-houses-to-the-acre zone, the population per net acre (excluding roads) shall not exceed 100 persons. Further, flats and residential buildings shall only be permitted in any residential zones

by consent; each proposal to receive individual consideration as to suitability and character. [163]

### (e) General matters concerning flat development

Flats are not considered to be suitable dwellings for families with small children or for young married people. Consequently it appears undesirable that more than about one-fifth of the dwellings provided in residential areas should be in the form of flats. Flats without lifts should not generally exceed three storeys in height; although some four-storey sections may be permitted to give architectural interest, in which cases the top flats might preferably be for single persons. Where lifts are not installed, access by means of communal balconies should not be provided. [164]

In high buildings provided with lifts, blocks should preferably be developed in two-storey maisonettes, each having its own internal staircase to its upper floor. The communal access balconies need then be provided only on alternate floors so that they will not overshadow rooms used during the daytime (i.e., living-rooms and kitchens), while persons asleep will not be disturbed by the people using them. [165]

Room sizes in flats should be not less than those accepted as satisfactory in houses of the general character and quality normal to the particular density zone. Sufficient accommodation should be provided for the washing and drying of clothes, storage of perambulators, etc. [166]

All flats should be provided with individual balconies of adequate size, such balconies to be planned so that they do not come immediately over living-room and kitchen windows. [167]

## APPLICATION OF STANDARDS

The adoption of adequate standards of density and open-space provision—together with the information obtained from the surveys of residential congestion and of undeveloped lands—have provided the basis upon which the residential development and redevelopment problem could be investigated, so establishing the extent to which it could be solved within the regional area. [168]

A general assessment of the residential capacity of the region has been made. For this purpose it has been assumed that all existing residential

development at a density exceeding 24 houses to the acre will ultimately be redeveloped. The time when the longer-term redevelopment of areas at a density below 24 houses per acre will take place is still so far ahead that it can in no way affect the immediate "overspill" problem. By this time, and in all probability before, a declining population will not need more than the accommodation which will be available on redevelopment. [169]

The districts making up the region may be divided into three categories:

- (a) Those where redevelopment of the congested areas will necessitate an "overspill" of people. These include Manchester, Salford and Stretford. [170]
- (b) Those which, in addition to providing the extra space required for rehousing people from their own congested areas, have space to absorb some "overspill" population from other districts. These include Middleton, Denton, Irlam, Urmston and Worsley. [171]
- (c) Those which can provide for their own redevelopment needs, but which cannot provide for an intake of people from other areas on any substantial scale. These include Eccles, Prestwich, Swinton and Pendlebury, Audenshaw, Failsworth and Droylsden. [172]

Table 7 sets out the extent of the "overspill" problem. The figures in column 3 are the estimated populations of the overspilling authorities for the year 1961 taking into account population trends and voluntary emigration and immigration. The figures in column 4 are the estimated ultimate populations of the three districts after redevelopment of the congested residential areas and after

building on any suitable undeveloped sites which are available to the standards previously outlined. It is not anticipated that all redevelopment will have taken place by 1961 and the figures in column 5 are the estimated populations at that time. It is expected, however, that after 1961 the decline in population, including voluntary emigration, will be such that no further "overspill" will arise, but that the fewer dwellings secured in redevelopment will meet the needs of a diminishing number of families. The "overspill" figures in persons are given in column 6 and in houses in column 7. [173]

The average number of persons per dwelling in the region before the war was 3.5; it is expected that with a rising standard of living a larger proportion of elderly or young people will live in separate units as a matter of choice when such accommodation is more generally available. Moreover, the sharing of one house by two or more families will be gradually eliminated. Consequently, it has been estimated that by 1961 the average number of persons will be 3.25 per dwelling. [174]

Part of the "overspill" can be accommodated within the regional area: the extent to which provision can be made is shown in Table 8. [175]

Column 2 gives the ultimate number of houses that can be accommodated in each district after allowing for internal redevelopment. Column 4 gives the theoretical intake of houses assuming that all lands capable of development would be built-up. [176]

The figures in column 5 have been determined after taking into account that:

Table 7  
EXTENT OF OVERSPILL PROBLEM

Local authority (1)	Estimated population 1938 (2)	Estimated population 1961 (taking into account population trends, voluntary emigration and immigration) (3)	Ultimate population after redevelopment (4)	Estimated population 1961 (taking into account redevelopment programme) (5)	Overspill population (3-5) (6)	Overspill houses (at 3.25 persons per house) (7)
Manchester .. ..	731,800	659,300	475,000	520,500	138,800	42,718
Salford .. ..	190,000	171,200	89,400	97,000	74,200	22,831
Stretford .. ..	59,700	57,200	51,400	53,200	4,000	1,231
				Total	217,000	66,780

Table 8

## ACCOMMODATION OF OVERSPILL WITHIN THE REGION

Local authority	Ultimate number of houses	Houses existing	Intake	Accommodation of overspill (houses)
(1)	(2)	(3)	(4)	(5)
Middleton ..	18,600	9,649	8,951	7,000
Denton ..	10,130	7,789	2,341	1,000
Irlam ..	6,833	4,078	2,755	500
Urmston ..	12,994	11,146	1,848	1,250
Worsley ..	21,875	7,752	14,100	10,000
Absorption of overspill in region ..			19,750	

(a) Allowance must be made for the provision of a proportion of low-density houses—some of which will be required for outstanding demands, i.e., young married couples, persons at present sharing accommodation, etc.

(b) It is not practicable to include as part of the solution of the “overspill” problem many small undeveloped sites in the various districts of the region which, however, in the aggregate make up an appreciable fraction of the total available area. In any case, such lands will in all probability be developed to absorb the voluntary movement of people, many desiring owner-occupied accommodation, for which allowance has been made in calculating the future population figures of the “overspill-ing” authorities. [177]

The low-density development referred to in (a) will, however, release some dwellings in the areas of these authorities, which can be used by people from the congested areas. Consequently, it has been assumed that a further 4,500 houses may in this way become available—thus increasing the intake to a figure of 24,250. [178]

Upon this basis, therefore, the “overspill” from the regional area would be 66,780–24,250, or approximately 42,500 houses. [179]

It will be noted that the districts within the region which possess most lands available for development are Middleton and Worsley. The Middleton Corporation has approved in principle a scheme allowing for an ultimate population of 60,000 persons. It is suggested that Worsley, with a substantial amount of undeveloped land capable of development, should be limited to an ultimate

population of 70,000 persons. In this district there are fine stretches of woodland and the southern part is rich in amenity value. It is here that provision must be made for the better type of low-density residential development. [180]

The conclusions arrived at from this investigation are not of a final nature, nor will they be until the detailed planning of the region has been completed. Factors which must be taken into account are a possible increase in voluntary migration from the area, variations in the future birth rate trends and the effects of national policy in relation to the location of industry. [181]

From this initial investigation it is abundantly clear that the housing problem is one which cannot be solved adequately within the region, also that consideration must be given to the matter on a regional basis to prevent the proposals of one authority from overlapping those of another. [182]

The Barlow Commission in its Report on the Distribution of the Industrial Population (Cmd. 6153, H.M. Stationery Office) recommended that, where decentralisation or dispersal is found desirable in respect of congested urban areas, consideration should be given to the following:

- (a) Garden cities or garden suburbs.
- (b) Satellite towns.
- (c) Trading estates.
- (d) Further development of existing small towns or regional centres (provided adequate planning schemes are applicable thereto).
- (e) Other appropriate methods. [183]

In deliberating on the alternative means of absorbing the regional “overspill” the industrial element of planning must receive careful consideration. It will be useless to spread residential development unless a parallel dispersal of industry can take place and be suitably sited at the same time. This is a problem which has been lightly talked of, but which has never been attempted on the scale which will be required if our big cities are to be redeveloped on creditable and satisfactory lines. [184]

Therefore, before the principles can be established upon which approximately one-half of the houses in the region are to be redeveloped, an examination must be made into the location and types of industries established in the area. This aspect of planning has been investigated in some detail (see Chapter VI). [185]

The possibilities of development under methods (a), (b) and (d) mentioned above are now under consideration in conjunction with the Cheshire and Lancashire county councils. While it may be possible to accommodate some part of the "overspill" by additions to existing small towns, it would appear that the problem may also necessitate the bold development of one or more satellite towns. In any case it will, no doubt, be found necessary to have a combination of developments in progress at the same time so that "overspill" population may have an ample choice of location suitable to their requirements. There can obviously be no attempt to coerce people into any one particular channel or direction.

[186]

In considering sites for a satellite the following major considerations must be borne in mind:

- (a) convenience of communications, existing or immediately practicable,
- (b) the physical suitability of any site, including climatic conditions, elevation, contours, drainage and geology,
- (c) the possibility of providing the necessary services,
- (d) the agricultural category of the land affected,
- (e) the effect of any new settlement on the general economy and social structure of the area, and
- (f) as previously stressed, the suitability of the site for industrial development.

[187]

# V

## NEIGHBOURHOOD AND DISTRICT

"For the proper social well-being of the large town, then it is necessary to work out some organisation of its physical form which will aid in every way the full development of community life and enable a proper measure of social amenities to be provided and arranged to advantage in each residential neighbourhood. The idea of the 'neighbourhood unit' arises out of an acknowledgment of the necessity of doing this and offers the means of doing it."

(*"Design of Dwellings"*, H.M. Stationery Office, 1944)

THIS EXTRACT certainly applies to the Manchester region. The absence of natural barriers between the areas of local authorities and the sprawl of congested residential development—often intermingled with worn-out industrial buildings—have tended to break down that feeling of local pride and interest so pronounced in many of our smaller cities and towns. [188]

Large-scale development and redevelopment schemes in the region and the layout of any satellite town (or towns) should be carried out on sound neighbourhood-unit planning principles. Much research has been undertaken in this connection, and the regional plan provides for:

- (a) The development of residential neighbourhoods through which only purely local traffic necessary to each will pass, these neighbourhoods being in turn grouped into districts.
- (b) The reservation of adequate sites for social, religious, and local business purposes.
- (c) The placing of homes and workplaces within reasonable distance of one another.
- (d) The establishment of neighbourhood centres as focal points for local activities, and district centres offering intermediate facilities between those contained in the neighbourhood centres and those in the regional centre. [189]

### THE NEIGHBOURHOOD

The sociological aspect of neighbourhood planning is summed up in the following extract from a report adopted by the Manchester City Council:

There must be provided, if planning is to be really worth while, centres through which the life of the city can flow. Without these centres, and without their very careful, correct and understanding planning, living in cities will

continue at its present level of indifferent sprawl, with the majority of its inhabitants uninterested in its welfare, and the welfare of their fellow beings, let alone their larger responsibilities both national and international. [190]

These centres of interest and life can, no doubt, be best provided as the centres of neighbourhood or community groups, each of sufficient size to maintain its own educational facilities, i.e., nursery, infant, junior and senior schools. A neighbourhood unit will contain a population of from 8,000 to 12,000 persons. These people should be able to provide a sufficient breadth of social, recreational and educational interests to maintain an active, energetic and healthy community centre, or people's club, which, if developed in close proximity to the senior school, would benefit from a regular transference of new members from such school and give easy opportunity for a continuance of social education and a proper acceptance of social responsibilities. [191]

### NEIGHBOURHOOD REQUIREMENTS

The theoretical requirements of a neighbourhood have therefore been assessed on the basis of a population of 10,000 persons. Applied to particular sites they will, in practice, require modification so that a proper development of natural features and amenities may endow each neighbourhood with an individuality and character of its own. However, it may be expected that these variations will tend to balance one another so that no large error should result from the use of the average neighbourhood density figures in estimating the accommodation which will ultimately be provided in various parts of the region. [192]

For social reasons it is desirable that the 10,000 people to be accommodated in the average neighbourhood should be, as nearly as possible, representative of the whole community in family structure and income range. Each neighbourhood, whether in new development or in a redevelopment

area, should contain approximately the same range of people from each type of family unit, properly housed in accordance with their characteristic needs. In order to keep within manageable bounds the number of people displaced by the redevelopment of congested districts, it will be necessary to rehouse on the site as many of them as can possibly be accommodated in reasonably healthy and attractive conditions. [193]

It is accordingly proposed that residential neighbourhoods should in general be developed in conformity with one or other of three main standards:

(a) "Normal" standard—applicable to new development areas such as Wythenshawe (Manchester) and undeveloped parts of Middleton and Worsley.

(b) "Close" standard—applicable to redevelopment areas outside the Intermediate Ring Road.

(c) "Maximum" standard—applicable to redevelopment areas within the Intermediate Ring Road. [194]

Summarised in Table 1 below are the provisions for a neighbourhood of 10,000 people under each of these three standards. [195]

### The Neighbourhood Centre

The neighbourhood centre should incorporate the community centre, local shops, churches, public houses, branch library and health sub-centre. It will thus form the natural meeting-place for the local population. [196]

Of the group of buildings forming the centre, by far the most important socially will be the community centre. A population of 10,000 should warrant the provision of facilities for a wide range of activities including arts and crafts, music, drama, photography, games and recreation. The centre must be in all respects a people's club

Table 1  
REQUIREMENTS OF A NEIGHBOURHOOD UNIT  
(10,000 persons at 3.25 persons per dwelling = 3,077 dwellings)

	NEW DEVELOPMENT		REDEVELOPMENT			
	"Normal"		"Close"		"Maximum"	
	Number	Acres	Number	Acres	Number	Acres
<b>Neighbourhood centre</b>						
Community centre	..	..	1	4.0	1	3.0
Branch library	..	..	1	0.5	1	0.5
Health sub-centre	..	..	1	2.0	1	1.5
Shops	..	..	30*	4.3	30*	3.5
<b>Other requirements</b>						
Churches, halls, etc.	..	..	—	7.5	—	5.0
Public houses	..	..	5	3.0	6	2.4
Additional shops	..	..	8	0.56	8	0.5
Dwellings	..	..	3,077	231.98	3,077	172.67
Nursery schools	..	..	5	1.66	4	1.33
Infant schools	..	..	2	3.0	1	2.0
Junior schools	..	..	2	10.5	1	4.5
Children's playparks	..	..	—	5.0	—	5.0
Organised games	..	..	—	21.0	—	21.0
Ornamental parks	..	..	—	20.0	—	—
Allotments	..	..	—	10.0	—	10.0
Minor parkways	..	..	—	10.0	—	4.0
Total acreage	..	—	335.00	—	236.90	—
Gross neighbourhood density in dwellings per acre	..	—	9.18	—	12.99	—
Gross neighbourhood density in persons per acre	..	—	30	—	42	—

\* Minimum number. Space reserved for 15 additional shops.

satisfying the common needs of the whole population. The building might include a gymnasium, plunge and shower baths and a young people's club. The juxtaposition of a modern school would encourage a constant inflow of new young members. Improved education, the raising of the school-leaving age and the establishment of county colleges will certainly foster a wider interest in cultural pursuits and a growing acceptance of social responsibilities. Everything should be done to increase the attractions of the community centre. [197]

The health sub-centre should incorporate the medical facilities envisaged in the White Paper on a National Health Service. [198]

### Shopping Facilities

Much research has been undertaken to ascertain the minimum numbers and types of shops which should be provided in the neighbourhood centre and sub-centres. The neighbourhood shopping centres are not isolated groups, but form parts of the regional scheme. In some areas of new development, shops are too few and shopping centres too far apart. In the older areas—in part owing to the haphazard conversion of dwelling-houses in the past—there is a general over-provision of shops. [199]

Accessibility and ease of distribution are the chief considerations in the siting of the local shopping groups. These should be designed to meet the local demand for food and the minor personal needs of everyday life. [200]

In new development the minimum requirements of a neighbourhood centre will be 30 shops covering 2.86 acres (including an allowance for car parks, garages and service roads). A further 1.44 acres (making 4.3 acres in all) should also be reserved to allow for the future additions which might be necessitated by a general rise in the standard of living. To supplement the main shopping group, two subsidiary centres are proposed, each comprising four shops and each occupying an area of approximately 0.28 acres. Thus a total area of 4.86 acres (including room for additions) is reserved in each standard neighbourhood unit. [201]

The suggested minimum allocation of shops in each unit is set out in Table 2. [202]

In redevelopment areas the need to economise space calls for a more compact shopping area and the reservation has accordingly been reduced to four acres in all. [203]

Table 2  
ESTIMATED MINIMUM SHOPPING REQUIREMENTS  
FOR A NEIGHBOURHOOD UNIT  
(Population 10,000)

Trade	Number of shops in neighbourhood centre	Number of shops in two subsidiary units
Grocery and provisions ..	4	2
Bakery and confectionery ..	2	2
Butcher .. ..	3	2
Dairy .. ..	1	—
Fishmonger .. ..	1	—
Fish and chips .. ..	1	—
Greengrocer .. ..	3	2
Tobacconist, newsagent, etc.	3	—
Gents' outfitters .. ..	1	—
Women's outfitters, drapers, etc. .. ..	2	—
Boots and shoes (sales) .. ..	1	—
,, (repairs) .. ..	2	—
Hardware .. ..	1	—
Hairdressing .. ..	1	—
Chemist .. ..	1	—
Post office .. ..	1	—
Bank .. ..	2	—
Totals ..	30	8
Total number of shops in unit = 38		

### Churches, Halls, etc.

Guidance on the distribution of church sites in new development and the redundancy of existing churches in redevelopment areas is available to the Regional Planning Committee through a representative and independent Churches Planning Committee. [204]

Church requirements have been estimated as follows:

- (a) Church of England—one church per neighbourhood.
- (b) Free Churches—one church per neighbourhood.
- (c) Roman Catholic Church—one church per three neighbourhoods.

The Roman Catholic requirements may vary throughout the region, but on the basis of Roman Catholic figures for Manchester (12.27 per cent of the population) one church would be required per 24,000 of the population. [205]

The area to be reserved for three neighbourhoods would be:

Church of England—3 churches at $2\frac{1}{2}$ acres	= 7.5 acres.
Free Church —3 churches at 2 acres	= 6.0 ,,
Roman Catholic —1 church at $2\frac{1}{2}$ acres	= 2.5 ,,
	16.0 ,,

Total per neighbourhood =  $5\frac{1}{2}$  acres. [206]

Including provision for such church halls as may be necessary, a figure of 0.75 of an acre per 1,000 people for churches in new development areas does not appear unreasonable, and would permit them to be set in surroundings appropriate to their dignity. For redevelopment areas a figure of half an acre per 1,000 persons is suggested. The desirability of reserving sufficient land for church halls, or halls which may be used in connection with such organisations as the Church Lads' Brigade and Boy Scouts Association, must not be overlooked. [207]

### Public Houses

Preliminary discussions have taken place with the Manchester and District Brewers' Society, but proposals for the provision of public houses have not yet been worked out in detail. Meanwhile, it is suggested that neighbourhood public houses should be of the smaller and more intimate type with probably a medium-sized house at the neighbourhood centre. Thus there would be a choice of smaller houses within convenient reach of all parts of each neighbourhood. [208]

From Board of Trade figures relating to the quantity of beer brewed, the national average consumption in 1939 was 0.52 of a barrel per head per year; in 1943 it was 0.62 of a barrel. Comparable figures for Manchester were 0.75 and 0.83 of a barrel respectively. Such higher figures are typical of large industrial towns. [209]

In estimating neighbourhood public house requirements, allowance must be made for consumption at public houses in the regional centre, in district centres and in industrial areas; the remaining balance to be provided in neighbourhoods will be influenced by the extent, if any, to which alcoholic drinks are to be served in community centres. [210]

*The Regional Centre.*—Before the war there were 73 public houses in the Manchester city centre. Assuming an average consumption per public house of 20 barrels per week, the drink consumed—averaged over the regional population—would amount to 0.06 of a barrel per head per annum. [211]

*District Centres.*—The provision of one large public house and two medium houses per district centre would correspond to a consumption of 0.09 of a barrel per head per annum. An additional demand for industrial areas might best be met by a

slight increase in public-house provision in adjacent residential areas. [212]

*Neighbourhood Development.*—It would appear reasonable to assume that a substantial improvement in living conditions and amenities may result in a consumption of beer in redevelopment areas below the Manchester pre-war average. Thus in assessing future requirements 1939 consumption figures have been used, but the maximum turnover for each type of public house has been assumed. The balance of beer per head of population to be supplied in the neighbourhood would amount to 0.60 (0.75-0.15) of a barrel per person per annum, or 115 barrels per week per 10,000 persons. This supply could be obtained by providing the following houses in each neighbourhood unit of 10,000 persons:

2 medium public houses selling 25 barrels per week	= 50 barrels.
4 small     ,     ,     , 15     ,	= 60     ,

 [213]

In new development areas, where there will be a large number of alternative attractions, a consumption equal to the 1939 national average might be expected. On the basis of 0.37 (0.52-0.15) of a barrel per person per annum, or 70 barrels per week per 10,000 persons, the necessary accommodation would be provided by:

1 medium public house selling 20-25 barrels per week	= 25 barrels.
4 small public houses selling 12-15 barrels per week	= 60     ,

 [214]

The area to be reserved for public houses will amount to 3.0 acres in new development and 2.4 acres in redevelopment areas. [215]

### Dwellings

The numbers and types of dwellings to be provided will vary in accordance with the needs of each neighbourhood. Table 3 sets out the average proportions of the different types of dwellings which might be provided according to the three standards mentioned earlier. [216]

The maximum net density for each type of dwelling is applied in both the inner and outer redevelopment areas ("maximum" and "close") in order that the number of people to be rehoused elsewhere may be kept to a minimum. The difference in net residential density is therefore limited to the effect of the larger proportion of houses prescribed by the "close" standard. [217]

In certain parts of the region (e.g., Worsley),

Table 3  
RESIDENTIAL REQUIREMENTS—10,000 PERSONS

Type of dwelling	"Normal"			"Close"			"Maximum"		
	Number of dwellings	Net density	Acres	Number of dwellings	Net density	Acres	Number of dwellings	Net density	Acres
Houses . . . . .	2,484	12.5	217.50	2,199	16	152.06	1,975	16	138.25
Cottage flats . . . . .	234			234			237		
Flats . . . . .	221	24	9.21	495	30	16.50	716	30	23.86
Single persons' flats . . . . .	115	30	3.83	126	40	3.15	126	40	3.15
Old people's cottage flats . . . . .	23	16	1.44	23	24	0.96	23	24	0.96
Total . . . . .	3,077	—	231.98	3,077	—	172.67	3,077	—	166.22
Net residential density . . . . .		13.26			17.82			18.51	

there will be a demand for better-class, low-density development. A net density of six houses per acre would be appropriate in these cases, with a slight increase if provision is made for a small proportion of flats. [218]

### Schools

The Education Act of 1944 has been used as a basis for calculating school requirements. This Act contains a number of provisions which impose new responsibilities upon the local education authority. Among them are the raising of the school-leaving age to 15, and ultimately to 16, with the attendant obligation to provide a secondary education for all; the establishment of nursery schools or classes wherever they are in demand, for children from two to five years of age; the continued education of all persons to the age of 18, either by full-time attendance at a secondary school or by part-time attendance at a county college; and power to establish or support community centres. [219]

These provisions compel the allocation of much more land for school use in the planning of residential areas. In the case of existing school buildings which are worth retaining, playing-fields will presumably need to be enlarged; the official standards have not yet been indicated. [220]

Redevelopment involving the dispersal of people from congested residential areas will cause redundancy in the inner districts and deficiencies elsewhere. The programme of school construction must, therefore, be planned in conjunction with the redevelopment programme. [221]

*Calculation of school requirements.*—The average number of school children in each age-class per 10,000 persons in 1943 was 138 in the city of Manchester, with 214 in new development at Wythenshawe, where young married couples predominate. (The term age-class is used to denote the surviving children born in any given year.) [222]

As the present Wythenshawe families grow older the proportion of school children will fall below the average; thereafter it will continue to fluctuate to a diminishing extent until time evens out the age structure of the population. Consequently, if enough school accommodation is provided to satisfy early requirements it will not be fully used later on. There are two means of minimising waste on this account. First, the population structure in new development areas must be made as representative as possible, and this can best be accomplished by building dwellings of different types in the proper proportions to house a composite section of the populace. Secondly, the permanent school buildings must be designed to accommodate rather fewer pupils than will at first attend them. [223]

A figure of 175 children in each age-class per 10,000 persons has been taken as the basis for calculating future needs in new development. This is the average of the figures for Wythenshawe and for the city. About 35 of these children, it is estimated, will be Roman Catholics. In the case of redevelopment areas a figure of 128 children in each age-class has been taken as the basis for calculating future needs; of these 28 will be Roman Catholics. [224]

Within the age-classes which will qualify for secondary schooling under the new Act there were in 1939 (according to statistics published by the Board of Education) 505,000 pupils attending elementary schools, 74,000 attending grammar schools and 4,600 attending technical schools. Thus, ignoring private schools, the corresponding attendance at government-aided secondary schools under the new Act would be:

Modern schools .. ..	86.5 per cent
Grammar schools .. ..	12.5 "
Technical schools .. ..	1.0 "

[225]

These proportions should be varied to give a higher proportion attending technical schools in the future. For the purpose of these calculations attendance has, therefore, been estimated as follows:

Modern schools .. ..	72 per cent
Grammar schools .. ..	13 "
Technical schools .. ..	15 "

[226]

It has been assumed throughout that the Roman Catholic Church will desire to provide its own schools, with the possible exceptions of technical schools and county colleges, and their requirements have been assessed accordingly. Other voluntary schools would reduce the provision to be made by the education authority. For the purpose of calculating future requirements, however, they have been grouped together with municipal schools; responsibility for the management of individual schools will be a matter for later adjustment. [227]

#### *Nursery Schools (for children aged two to five).*

Under the Education Act, all local education authorities will be obliged to provide nursery schools or, where they consider such provision to be inexpedient, accommodation for nursery classes in other schools. Each nursery school should accommodate 40 children. They should be centrally situated within each residential group in the neighbourhood so that the distance from home to school may be as small as possible. [228]

In new development, five schools accommodating 200 children would suffice for an attendance of about 50 per cent of the children aged two to five years (excluding Roman Catholics) in a neighbourhood. In a redevelopment area four schools would suffice. Where a Roman Catholic primary or secondary school is provided a nursery school could be placed on the same site. [229]

#### *Infant Schools (for children aged five to seven).*

The maximum number of pupils in each class will be 40, as compared with the pre-war average of 50. From an educational and administrative point of view infant and junior schools should each accommodate two form-entries. (Form-entries are the complete forms entering the school each year.) [230]

Excluding Roman Catholic children, in new development the number of children in each age-class to be accommodated in infant schools will be 135. Two two-form-entry infant schools per neighbourhood will therefore be required. A two-form-entry school is rather a small unit for urban areas; hence, although the Ministry of Education says that infant and junior schools of this size should be organised separately, it is suggested that a two-form-entry infant school might be put on the same site as a two-form-entry junior school, provided the layout of the neighbourhood and the density of housing make this arrangement conveniently practicable. [231]

In redevelopment areas, excluding Roman Catholics, 110 children in each age-class will have to be accommodated. To provide two two-form-entry schools would reduce the average class to only 25 pupils. One three-form-entry school is therefore suggested. [232]

#### *Junior Schools (for children aged seven to eleven).*

Excluding Roman Catholics, junior schools in a new development neighbourhood of 10,000 people would be required to accommodate four age-classes or 540 children in all. Two two-form-entry junior schools would give an average school class of 34 children. [233]

In redevelopment areas with 100 children in each age-class, the provision of two two-form-entry schools would again be extravagant, giving an average class of only 25 pupils. One three-form-entry junior school is therefore suggested. [234]

#### *Secondary Education*

Of the three types of secondary education, modern schools will offer an extended education of the type given to-day by many senior schools, and will combine cultural subjects with more practical activities; grammar schools will offer a curriculum on more academic lines and will be suitable for the pupil who intends to enter one of the professions;

technical schools will give a good general education combined with more specialised training for those scholars intending to enter commerce and industry. These last will be of great importance in the future as the prosperity of the country will depend on the technical progressiveness of its industry and the skill and efficiency of its workers. [235]

Pupils leaving school at 15—and later at 16—will receive part-time education at county colleges during normal hours of employment. In addition, these colleges may well serve as centres for the activities of an extended youth service. [236]

On the basis of the estimated distribution of children between the three types of secondary school the numbers in each age-class per 10,000 persons will be as follows: [237]

Distribution	New development		Redevelopment	
	Roman Catholic	Others	Roman Catholic	Others
Modern schools 72 per cent	25	97	20	72
Grammar schools 13 "	5	18	4	13
Technical schools 15 "	5	20	4	15
	35	135	28	100

Secondary-school accommodation cannot be calculated on the basis of the neighbourhood since a population of 10,000 will be insufficient to support a school of adequate size. Further, as only the older children will be concerned, distance from home is not so important as in the case of primary schools. Secondary schools, therefore, have been planned on a district basis. [238]

Generally, they are expected to be of three- or four-form-entry capacity with 30 pupils as the maximum recommended size of class. A three-form-entry school will thus accommodate 450 pupils when the leaving age is raised to 16. On this basis, secondary school requirements (excluding Roman Catholic children) in terms of neighbourhoods of 10,000 people will be as follows:

#### In new development

One modern school in each neighbourhood with one extra school to every 13 neighbourhoods.

One grammar school to every five neighbourhoods.

Two technical schools to every seven neighbourhoods.

#### In redevelopment

Four modern schools to every five neighbourhoods.

One grammar school to every seven neighbourhoods.

One technical school to every five neighbourhoods. [239]

#### Advanced Education

According to pre-war statistics, one child in every 14 was educated up to his eighteenth birthday. It seems reasonable to assume that the increase in secondary education will raise this proportion to, say, one in seven. On this basis, excluding Roman Catholic children, 20 pupils in each age-class per neighbourhood in new development will receive advanced education from 16 to 18. Advanced education facilities can best be provided by the addition of a number of classrooms to grammar and technical schools. [240]

If all persons, excluding those taking advanced education, continue their education in county colleges to the age of 18 on one day per week, accommodation will be required for about 29 pupils in each age-class per 10,000 people, and for 21 pupils in redevelopment areas. If each college has an annual intake of 900 pupils per year, or 180 for each day of the school week, one college will serve six neighbourhood units in new development or eight in redevelopment areas. Thus, with a two-year attendance, each college would accommodate 360 pupils. [241]

#### Roman Catholic Schools

In new development, one two-form-entry infant school and one two-form-entry junior school will be needed for every two neighbourhoods; in redevelopment areas three of each type will be needed in every eight neighbourhoods. [242]

Roman Catholic children under the age of 11 will have very long distances to travel to primary schools—contrary to the principles of neighbourhood planning. Some compromise solution to this problem may be found in allotting one combined one-form-entry infant and junior school to each neighbourhood in new development, and three to every four neighbourhoods in redevelopment areas. From the educational and administrative standpoints these schools may be considered too small, but from a planning point of view this is the best arrangement. [243]

One secondary school would be required for every four neighbourhoods, with one additional school to every 18 neighbourhoods in new development and one for every 22 neighbourhoods in redevelopment areas offering advanced education. [244]

The school requirements are summarised in Tables 4 and 5. [245]

Table 4  
SCHOOL REQUIREMENTS—NEW DEVELOPMENT

Type of school	Number proposed	Population served	Form-entries	Number of age-classes	Number of scholars per school	Total number of scholars	Building area and surrounds per school (acres)	Playing areas per school (acres)	Total area for schools (acres)	Total area per 10,000 of the population (acres)
<b>Neighbourhood schools</b>										
Nursery ..	5	10,000	—	3	40	200	0.33	—	1.66	1.66
Infant ..	2	10,000	2	2	160	320	1.50	—	3.00	3.00
Junior ..	2	10,000	2	4	320	640	2.00	3.25	10.50	10.50
<b>District schools</b>										
Modern ..	14	130,000	3	5	450	6,300	3.00	14.00	238.00	18.30
Grammar (including advanced education) ..	1	50,000	3	7	550	550	3.50	17.00	20.50	4.10
Technical (including advanced education and Roman Catholics)	2	70,000	3	7	550	1,100	3.50	17.00	41.00	5.86
County College	1	60,000	6	2	900	900	2.00	10.50	12.50	2.08
<b>Roman Catholic schools</b>										
Infant ..	1	20,000	2	2	160	160	1.50	—	1.50	0.75
Junior ..	1	20,000	2	4	320	320	2.00	3.25	5.25	2.62
Modern ..	1	30,000	3	5	450	450	3.00	14.00	17.00	5.66
Grammar ..	1	180,000	3	7	550	550	3.50	17.00	20.50	1.14
										55.67

The Ministry's suggestions for the organisation of primary, secondary and further education are, at the time of writing, still awaited. The assessment of areas required, as set out in these tables, may therefore require considerable modification. [246]

### Open Spaces

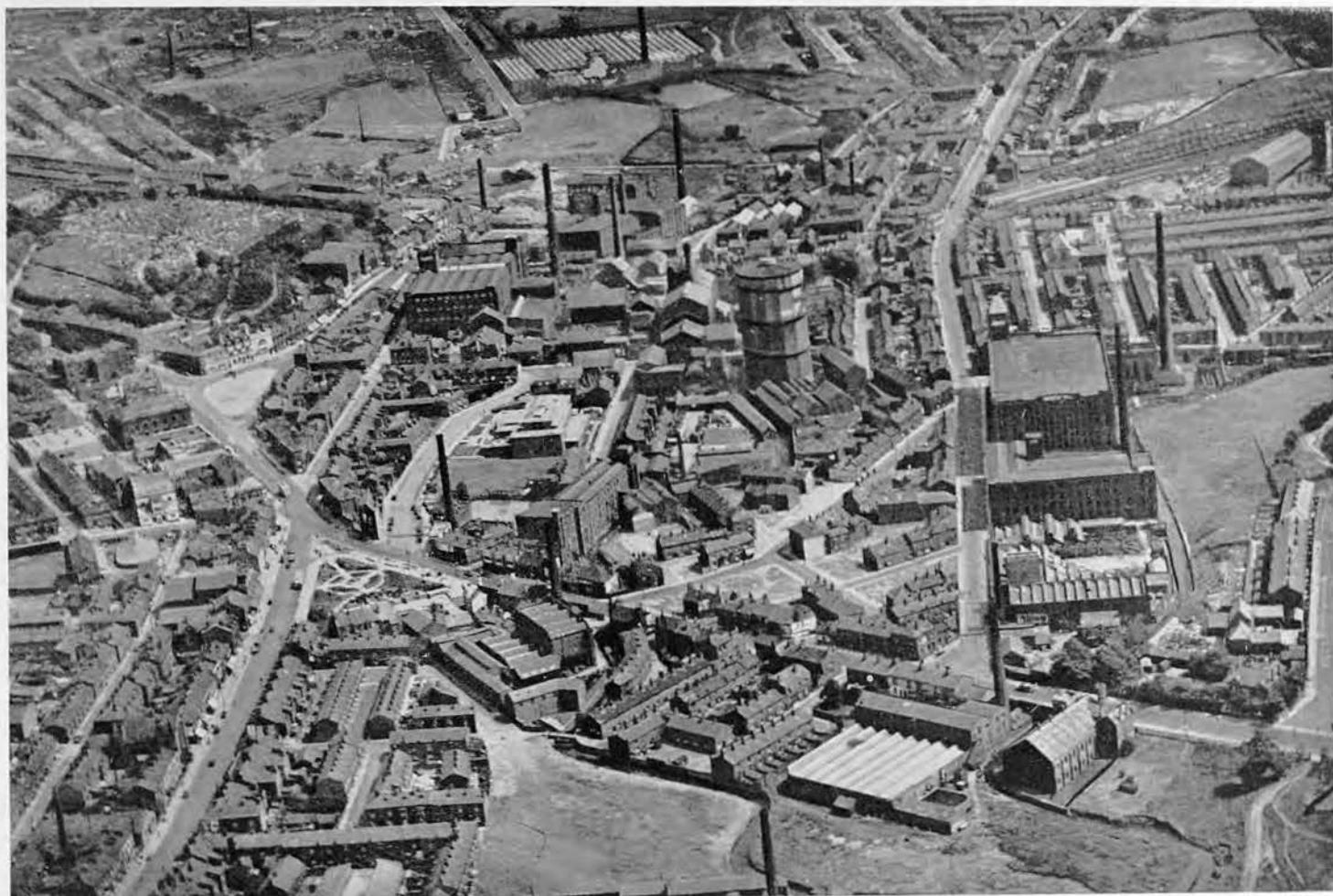
*Children's playparks.*—An allowance of half an acre per 1,000 persons has been made for children's playparks in both new and redevelopment areas. This is based upon a population of 120 children from four to 11 years of age per 1,000 people; assuming that approximately half the children will use the facilities at one time it provides for 40 square yards of playing space per child. [247]

*Organised games.*—On the basis of 4½ acres per 1,000 persons, 45 acres would be reserved for organised games per neighbourhood unit. The playing-field facilities which this acreage will provide are indicated on page 20. [248]

Details of the playing-field areas recommended for junior and secondary schools are given in Tables 4 and 5. In new development the pre-war standard will be exceeded by 24 acres per 10,000 persons. It is proposed that such additional areas should be regarded as part of the 45 acres of playing fields recommended for each neighbourhood; 21 acres will therefore remain to be provided. [249]

In redevelopment areas, where school playing-fields will not exceed the pre-war standard for new schools, the whole of the 45 acres required for public organised games will need to be found, but in view of the need to rehouse as many people in these areas as conditions will permit, it is suggested that 21 acres should be provided inside or close to the neighbourhood and the remaining 24 acres in outer districts where undeveloped land is available. [250]

*Ornamental parks.*—The suggested reservation is 20 acres for each neighbourhood (two acres per 1,000 people). [251]



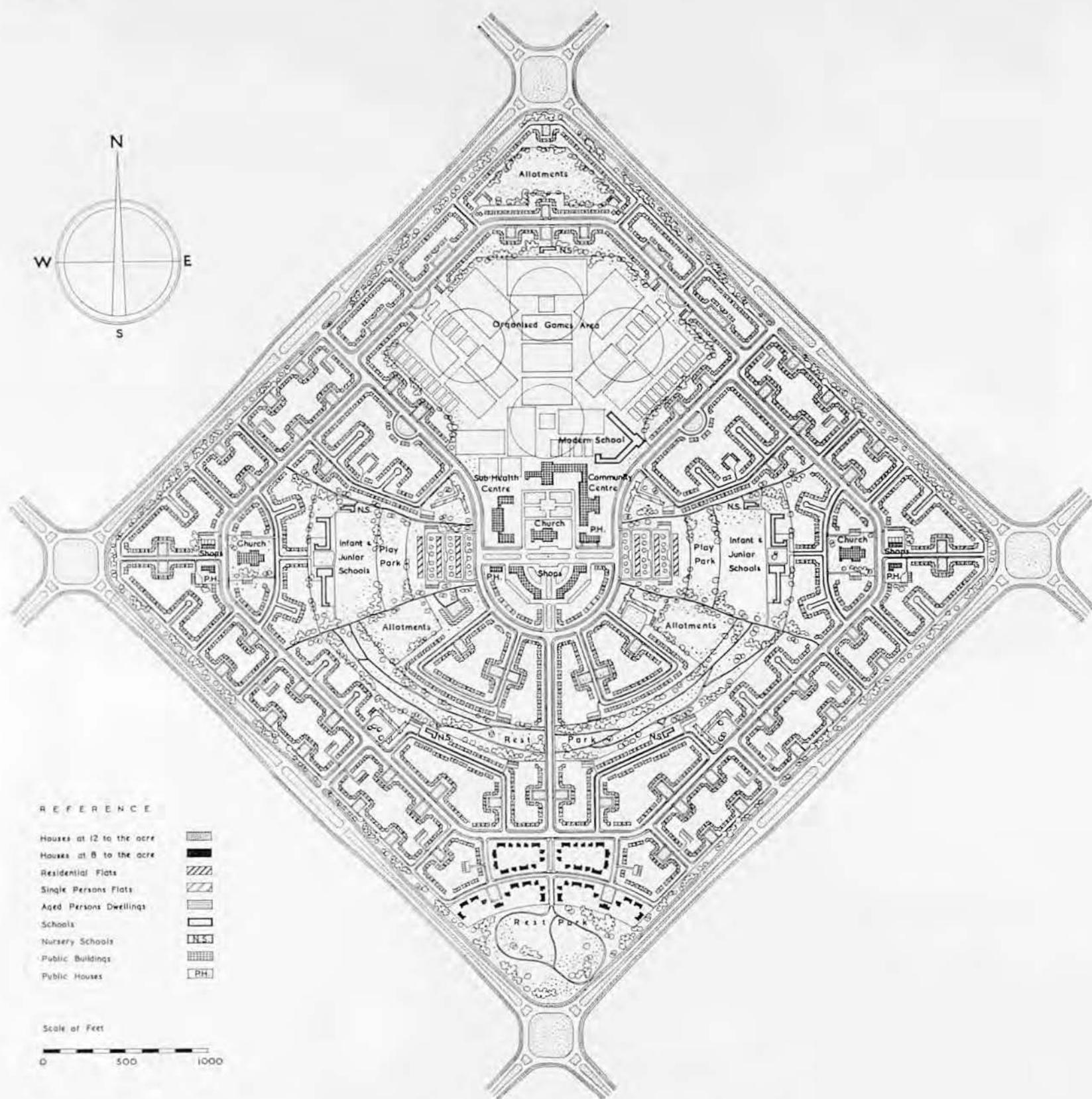
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1. Uncontrolled Development  
Typical of most northern industrial towns.
2. The proposed North-west neighbourhood, Wythenshawe  
Development in accordance with modern standards.



2



### A theoretical layout for a neighbourhood of 10,000 persons

Shops and communal buildings are grouped at the neighbourhood centre and sub-centres. The modern school adjoins the community centre, so that common facilities can be used by both; similarly, the juxtaposition of school playing-fields and public organised-games areas permits alternate use of the same pitches. The internal roads, planned to discourage through traffic, give convenient access to the major highways (which form the neighbourhood's boundaries) at a limited number of selected points. The residential accommodation includes flats and dwellings suitable for single and old people as well as two-storey houses of various sizes, some of which are distributed at low density.

Table 5  
SCHOOL REQUIREMENTS—REDEVELOPMENT

Type of school	Number proposed	Population served	Form-entries	Number of age-classes	Number of scholars per school	Total number of scholars	Building area and surrounds per school (acres)	Playing areas per school (acres)	Total area for schools (acres)	Total area per 10,000 of the population (acres)
<b>Neighbourhood schools</b>										
Nursery .. ..	4	10,000	—	3	40	160	0.33	—	1.33	1.33
Infant .. ..	1	10,000	3	2	240	240	2.00	—	2.00	2.00
Junior .. ..	1	10,000	3	4	480	480	2.00	2.50	4.50	4.50
<b>District schools</b>										
Modern .. ..	4	50,000	3	5	450	2,250	3.00	7.50	42.0	8.40
Grammar (including advanced education) ..	1	70,000	3	7	550	550	3.50	9.00	12.50	1.80
Technical (including advanced education and Roman Catholic)	1	50,000	3	7	550	550	3.50	9.00	12.50	2.50
County College	1	80,000	6	2	900	900	2.00	5.50	7.50	0.94
<b>Roman Catholic schools</b>										
Infant .. ..	3	80,000	2	2	160	480	1.50	—	4.50	0.56
Junior .. ..	3	80,000	2	4	320	960	1.8	1.7	10.5	1.31
Modern .. ..	1	40,000	3	5	450	450	3.00	7.50	10.50	2.62
Grammar .. ..	1	220,000	3	7	550	550	3.50	9.00	12.50	0.57
										26.53

*Allotments.*—The reservation of ten acres per neighbourhood, or one acre per 1,000 persons, is proposed except in the areas redeveloped at the “maximum” standard where the necessity for rehousing as many people as possible will preclude their provision. Under present circumstances the call for allotments is substantial even in the 12-houses-per-acre areas, amounting, for instance, to slightly more than one allotment per 15 houses on the Wythenshawe Estate, Manchester. The allocation proposed would provide for one allotment to every 20 houses. [252]

*Parkways.*—In new development and in redevelopment areas a reservation per neighbourhood of ten acres and four acres respectively is suggested for a parkway strip round the periphery of the unit except where it adjoins playing-fields and ornamental gardens. Trees could be planted along this strip to separate houses from adjoining main traffic routes, and also to accentuate the division between units. [253]

#### THE LAYOUT OF A NEIGHBOURHOOD

Plate 12, opposite, illustrates diagrammatically the principles upon which the detailed planning of neighbourhood units might be based. This treatment—an entirely hypothetical case—is for a typical neighbourhood of 10,000 persons in new development. [254]

Controlled junctions give safe access for local traffic from the major external roads to the internal neighbourhood roads, whose arrangement is designed to discourage through traffic. The principal internal roads are designed to feed all parts of the area, with radials leading towards the central focal point, the neighbourhood centre. [255]

Within this centre are sited the main shopping group, the health sub-centre, community centre, branch library, two public houses and a church. The community centre and the modern school are placed close together so that some of their accommodation may be interchangeable. The modern school's playing-fields and the public organised-

games areas are planned as one large open space for economical maintenance and greater flexibility in arranging for the "resting" of pitches. [256]

Nursery, infant and junior schools are sited to serve conveniently the surrounding groups of houses, with field paths taking the children to and from school in safety. [257]

Houses are grouped round the neighbourhood centre and the open spaces; an area at the southern extremity is reserved for low-density housing to secure a mixture of income groups within the neighbourhood. Garages have been provided in the ratio of one to every six houses, a proportion which must vary according to the type of each neighbourhood. [258]

Two subsidiary shopping centres are designed to serve the houses farthest from the neighbourhood centre, and two additional public houses occupy neighbouring sites. [259]

## THE DISTRICT

To divide the region into neighbourhoods does not complete the plan for developing social and civic responsibilities and interests. A wider sphere of activities and range of buildings is required to provide a link between the neighbourhood centre and the regional centre. Except in the cases of Manchester and Salford, these are provided by the town centres of each authority. In the two cities it is suggested that local pride and activities can be resuscitated by the suitable siting of district centres. In many cases these might be sited at the old village centres which have been submerged in the subsequent expansion of continuous development. [260]

Five neighbourhoods, housing approximately 50,000 persons, might make up a suitable unit. If the number is too big the district would tend to lose compactness; if too small, it could not support the wide range of desirable amenities required. These comprise a main health centre, public baths, a main library, cinemas, larger suburban shops, public houses, a residential hotel and fire and police stations. [261]

Detailed plans for each neighbourhood should conform with the district plan, which in turn should dovetail into the broad outline scheme for the region. Each district should be planned as a complete unit, with a road network for the circulation

of public transport interconnecting its component neighbourhoods. Secondary schools, which cannot be provided in every neighbourhood, should as far as possible be distributed in the larger district unit. The open spaces, shopping facilities and amenities for a population of 50,000 persons contained within the confines of the district make it more nearly self-sufficient than the neighbourhood. [262]

## DISTRICT REQUIREMENTS

Table 6 shows the provisions for a district of 50,000 persons in new development and redevelopment under each of the three main standards of development. [263]

### The District Centre

All parts of the district should have easy road access to the district centre. The district hall might incorporate a large public assembly room suitable for dramatic entertainments, concerts, or public meetings, and reception rooms. The district centre should also include a main library with a reference section, a main health centre, large public baths and two or three cinemas. There are advantages to be gained from cinema grouping in that the drawing-power of the centre would be increased. [264]

### Shops

The district-centre shopping facilities will be more comprehensive than those provided in the neighbourhood centres. It has been provisionally estimated that land should be reserved for a minimum of 96 shops together with a margin for expansion. Since the popularity of a district shopping centre will largely depend upon the enterprise of its traders and the purchasing powers of the customers, this reservation must obviously be flexible. [265]

Table 7 sets out the district shopping requirements. [266]

In addition, garages, repair shops, petrol filling stations and adequate car-parking facilities should be provided in each centre with convenient access to the filling stations from adjacent major roads. [267]

### General allowances

The gross district density of dwellings works out at 6.68 per acre in "normal" development (as

**Table 6**  
**REQUIREMENTS OF A DISTRICT UNIT**  
(50,000 persons at 3.25 persons per dwelling = 15,385 dwellings)

	NEW DEVELOPMENT		REDEVELOPMENT			
	"Normal"		"Close"		"Maximum"	
	Number	Acres	Number	Acres	Number	Acres
<b>Within five neighbourhoods</b>						
Community centres ..	5	20.0	5	15.0	5	15.0
Branch libraries ..	4	2.0	4	2.0	4	2.0
Health sub-centres ..	4*	8.0	4*	6.0	4*	6.0
Neighbourhood shops ..	190†	24.3	190†	20.0	190†	20.0
Churches, etc. ..	—	37.5	—	25.0	—	25.0
Public houses ..	25	15.0	30	12.0	30	12.0
Dwellings ..	15,385	1,159.90	15,385	863.35	15,385	831.10
Nursery schools ..	25	8.30	20	6.65	20	6.65
Infant schools ..	10	15.0	5	10.0	5	10.0
Junior schools ..	10	52.5	5	22.5	5	22.5
Children's playparks ..	—	25.0	—	25.0	—	25.0
Organised games ..	—	105.0‡	—	105.0‡	—	105.0‡
Ornamental parks ..	—	100.0	—	—	—	—§
Allotments ..	—	50.0	—	50.0	—	—
Minor parkways ..	—	50.0	—	20.0	—	20.0
<b>District centre</b>						
District hall ..	1	4.0	1	3.0	1	3.0
Main library ..	1	1.5	1	1.0	1	1.0
Main health centre ..	1	5.0	1	4.0	1	4.0
Cinemas ..	2	3.0	2	2.0	2	2.0
Public baths ..	1	2.0	1	2.0	1	2.0
District shopping, commercial and civic area ..	—	15.0	—	12.0	—	12.0
Public houses ..	3	3.75	3	2.2	3	2.2
Police station and fire station ..	1	2.5	1	2.5	1	2.5
Petrol stations and car parks ..	—	2.5	—	2.5	—	2.5
<b>Other requirements</b>						
Domestic industrial area ..	—	12.0	—	10.0	—	10.0
Additional organised games ..	—	—	—	120.0‡	—	—§
Ornamental parks ..	—	—	—	100.0‡	—	—§
Modern schools ..	—	91.50	—	42.0	—	42.0
Grammar schools ..	—	20.50	—	9.0	—	9.0
Technical schools ..	—	29.30	—	12.5	—	12.5
County colleges ..	—	10.40	—	4.7	—	4.7
Roman Catholic schools ..	—	50.85	—	25.30	—	25.30
Cinemas ..	2	3.0	2	2.0	2	2.0
Public baths ..	1	1.5	1	1.5	1	1.5
Major roads and parkways ..	—	370.0	—	195.0	—	195.0
Total acreage ..	—	2,300.8	—	1,735.7	—	1,433.45
Gross district density in dwellings per acre ..	—	6.68	—	8.87	—	10.73
Gross district density in persons per acre ..	—	22	—	29	—	35

\* The main health centre will also serve as one health sub-centre.

The district centre will also serve as the neighbourhood centre for the neighbourhood in which it is situated, the combined facilities being planned as one unit.

† Minimum numbers.

‡ Part use of school playing-fields will increase the organised-games provision.

§ Balance of open-space requirements provided outside district.

Table 7  
ESTIMATED MINIMUM SHOPPING REQUIREMENTS  
FOR A DISTRICT UNIT  
(Population 50,000)

Baker and confectioner	8	<i>Miscellaneous Shops</i>	
Boots and shoes—sales	4	Chemist	2
Boots and shoes—repairs	3	Cycles and prams	2
Butcher	7	Electricity and gas show- rooms	1
Café (can be located on first floor premises)	3	Electrician	2
Corn and seed shop	1	Funeral director	1
Dairy	2	Herbalist	1
Dyers and cleaners	2	Jeweller	1
Fishmonger	2	Milk bar	1
Furniture	2	Optician	1
Glass and china	1	Painter and decorator	2
Gents' outfitters	3	Photographer	1
Grocer and provisions	5	Radio	2
Greengrocer, florist and fruiterer	4	Stationer and bookshop	2
Hairdresser, ladies'	1	Secondhand furniture and antiques	1
" gents'	1	Sports outfitter, toys, etc.	1
Hardware	3	Wines and spirits	2
Newsagent, stationer, sweets and tobacco	3	Watch repairer	2
Sweets	2	Post office	1
Sweets and tobacco	2	Banks	4
Tobacco	2		—
Women's outfitter, drapery	2		—
Baby linen, millinery, etc.	3		30
	66	Total number of shops	96

compared with a neighbourhood density of 9.18 per acre); at 8.87 per acre in "close" development (corresponding neighbourhood density 12.99 per acre); and at 10.73 per acre in "maximum" development (corresponding neighbourhood density 13.96 per acre). As the size of the unit increases so the overall density decreases and progressively less benefit is obtained by crowding houses and flats at high densities. If the residential areas were

entirely redeveloped in flats, the increase in gross district density over the "maximum" standard, assuming full provision of public open space, would amount to 18 per cent only, as compared with an increase of 30 per cent in gross neighbourhood density and 45 per cent in net residential density. These figures throw a new light on the question of comparative densities of residential development. [268]

The allowance made for neighbourhood and district centres cannot be regarded as extravagant. Any economies which might be effected in their site planning would largely destroy the spaciousness and architectural dignity which their civic and social importance demand. [269]

Plate 13, opposite, shows the neighbourhood principle applied to the regional area. Sizes of units are limited in many cases by physical conditions, and their boundaries are not necessarily coterminous with those of the local authorities. The green-belt reservations and the neighbourhood open-space provisions will prevent the uncontrolled spread of development outward from the central areas. [270]

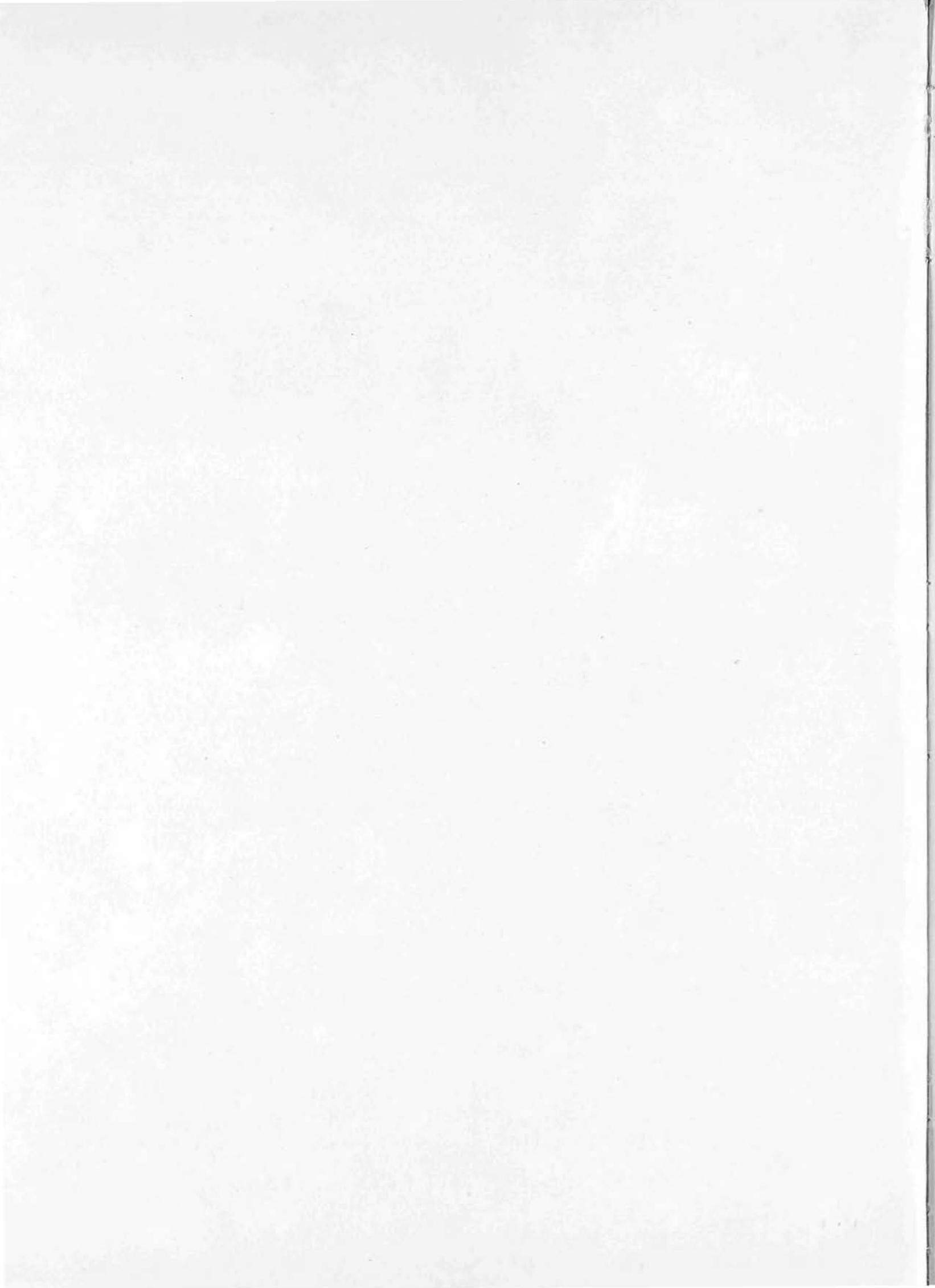
Audenshaw, Denton, Middleton, Irlam, Worsley and Wythenshawe (Manchester) will be able to retain their local identities by reason of fairly substantial breaks between them and the inner built-up core of the region. [271]

The gross district density figures given herein provide the basis upon which the ultimate residential accommodation throughout the region has been calculated. They assume that an adequate provision of schools, civic and social buildings, shops, churches and open spaces will be provided in all residential areas. They provide the only adequate means of calculation. The use of density figures for less comprehensive units tend to give false and over optimistic results. [272]

MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

# PLANNING PROPOSALS





## INTRODUCTION

THE MANCHESTER REGION has long been one of the foremost industrial areas of the world. Among the main factors contributing to its industrialisation may be mentioned the humid atmosphere, an abundance of soft water suitable for spinning, weaving and bleaching, access to the sea via the Manchester Ship Canal, and the presence of coal in and near the region. [273]

As in most northern industrial districts, the intermingling of factories, mills, business premises and dwelling-houses, without any semblance of order, results in a lack of light, air and good working and living conditions. [274]

In the case of the city of Manchester, the central commercial area is surrounded by an industrial "collar" (Fig. 15) which, from a planning point of view, should undoubtedly be broken by rezoning for residential and commercial purposes and by the projection of parkways from the residential areas into the regional centre itself. Such parkways would provide a much needed amenity and afford rapid and safe means of transit. [275]

In considering large-scale redevelopment proposals it is necessary to appreciate as fully as possible the industrial structure of the planning area. The industrial element of planning can in no way be divorced from the residential element. The

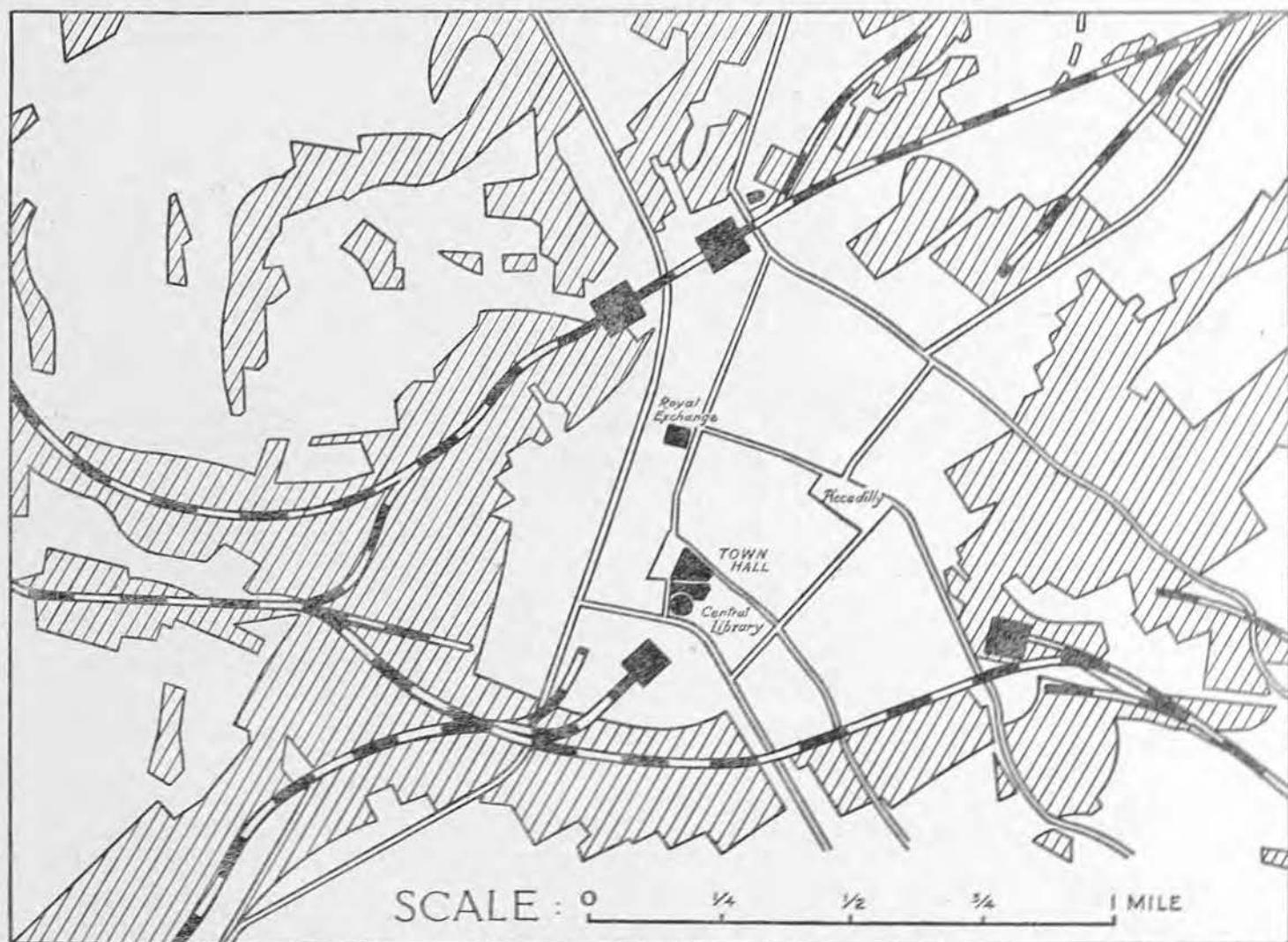


Fig. 15. THE INDUSTRIAL "COLLAR"—the hatching indicates the industrial belt surrounding the regional centre.

congested residential areas of the region are so densely developed that redevelopment in accordance with modern standards must necessitate the decentralisation or dispersal of a substantial part of the overcrowded population, but it will be useless to spread residential development unless a parallel spread of industrial development can take place at the same time. This poses one of the most difficult of planning problems.

[276]

An industrial survey of the regional planning area has therefore been undertaken in order to ascertain the relative importance of its established industries and to study the extent to which post-war and long-term planning can ensure its future prosperity.

[277]

### INDUSTRIAL STRUCTURE

As a first step in the survey the general industrial structure of the region as a whole was considered. The following schedule gives comparative figures for England and Wales, and for the Manchester region, indicating the number of persons engaged in industry and the percentage unemployed in 1931. Because of the predominance of the cotton and clothing industries there is a high proportion of female labour in the region.

[278]

	England and Wales	Percentage unemployed	Manchester region	Percentage unemployed
Males ..	11,563,591	14.6	361,319	18.7
Females ..	5,122,979	9.4	211,251	12.9
Total ..	16,686,570	12.9	572,570	16.5

In this connection it is interesting to note the remarks of the President of the Board of Trade (Mr. Dalton), made in a statement on the location of industry in the House of Commons on the 8th December, 1943. Mr. Dalton stated:

It is part of our policy, which will be, I hope, assisted by the various administrative measures I have been discussing, to create and maintain a greater diversity of industry than before the war in the difficult areas, which in the past have been too much dependent on one or two industries such as coal, cotton, shipbuilding and the like. It is never wise to have all the eggs in one basket, and there has been great unwisdom in our industrial layout in this country in that respect. How much better during those pre-war years have certain areas fared where there has been a great variety and diversification of industry and a more balanced employment!

[279]

The 1931 Census of Industry tables have been used to assess the national importance of the principal industries in the region by means of a

location index. This location index measures the concentration of an industry in the region in terms of the ratio between the proportion of persons in the regional area employed in that industry and the proportion so employed throughout England and Wales. An index of one indicates that the proportion of persons employed in a particular industry in the regional area is the same as the proportion so employed throughout England and Wales. Indices below or above one indicate the extent to which a particular regional industry is weak or strong as compared with the national average.

[280]

The following statistics show the location indices for the principal industries in the region, together with the numbers of persons employed in those industries, in the year 1931.

[281]

	Industry	Location index	No. of persons employed in region
1.	Textile dyeing, printing and bleaching	5.48	16,757
2.	Rubber .. .. .. ..	4.35	6,758
3.	Cotton .. .. .. ..	2.64	38,964
4.	Electric installations, etc. .. .. .. ..	2.48	20,917
5.	Clothing .. .. .. ..	2.47	60,225
6.	Metal industries .. .. .. ..	1.60	9,537
7.	General engineering .. .. .. ..	1.56	20,405
8.	Printing, paper making, etc. .. .. .. ..	1.54	21,133
9.	Distributive trades .. .. .. ..	1.36	104,664
10.	Furniture .. .. .. ..	1.26	5,784
11.	Food .. .. .. ..	1.25	17,073
12.	Leather .. .. .. ..	1.17	1,206
13.	Professions .. .. .. ..	0.77	15,044
14.	Building and contracting .. .. .. ..	0.67	19,996
15.	Hotel and catering .. .. .. ..	0.54	45,099
16.	Mining .. .. .. ..	0.23	7,080

It will be noted that though there is a marked concentration in the region of the first two industries, viz., textile dyeing, printing and bleaching, and rubber, the numbers employed are not great. Although Manchester is the commercial centre for the cotton industry, the clothing industry in 1931 employed a substantially greater number of persons in the region than cotton. Noticeable among the industries with a lower index than one are building and contracting and the hotel and catering services.

[282]

The amount of building undertaken in a district is usually a measure of its prosperity. The low location index (0.67) for the Manchester region might indicate a lack of confidence at that time (1931) in the future prosperity of the region. With well-planned redevelopment the building industry

# INDUSTRIAL SURVEY

## COMPARATIVE NUMBERS AND PERCENTAGES OF PERSONS EMPLOYED IN THE TEN MAIN INDUSTRIES

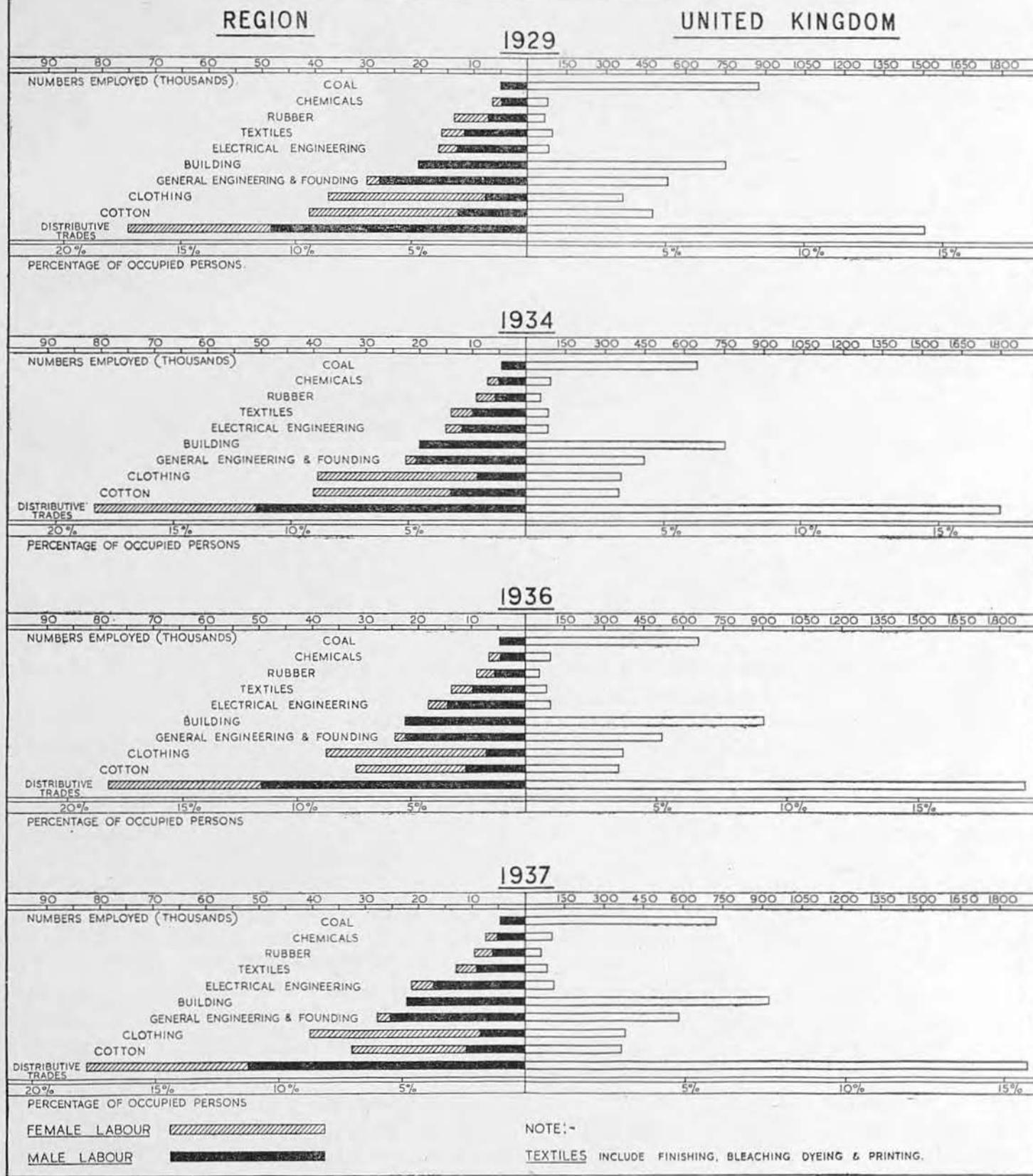


Fig. 16. Comparison of numbers of persons engaged in the principal industries—nationally and locally.

will doubtless expand, although such expansion will of course depend to some extent on national policy as to location of industry, and on the position in regard to international trade. Fig. 16, page 49, compares the numbers of persons engaged (nationally and locally) in the principal industries.

[283]

### TRENDS OF INDUSTRY

It is anticipated that the industrial aspect of planning will be largely a matter for consideration by the State. However, before any large-scale redevelopment proposals can be formulated for the region it is necessary to know the trend of employment in each of the basic industries in the area, what trades may be established to replace losses in declining industries, the extent to which decentralised industries may be re-established, and how far the establishment of new industries in new planned areas will permit the "loosening-out" of congested areas.

[284]

Trends in the main industries have been estimated from statistics based on figures supplied by the Ministry of Labour and National Service. It is stressed that these figures have definite limitations and do not include all employed persons in the region. For example, the unemployment insurance scheme does not cover all classes of workers, and areas served by Ministry of Labour offices are not necessarily coterminous with local authority areas. Further, the figures are based on the number of books exchanged annually at the labour exchanges. Some people will exchange their books near their work; others near their homes, which may be outside the regional area. Again, large firms with numerous branches may deposit the books in bulk at the exchanges nearest to their head offices.

[285]

No statistics have been given for the years 1930-1933, these being the years of general depression in industry throughout the country. Taking an index number of 100 as representing the number of insured persons employed in each particular industry for the year 1929, Table 1 gives an indication of the general trends.

[286]

It will be seen that general engineering suffered a sharp decline in 1934. This was due not only to a general decline nationally, but in particular to the migration of several large firms from the region. The industry improved generally towards 1937, but the index figure of 100 obviously could only

have been reached if new large firms had been established in the area.

[287]

Table 1  
TRENDS OF INDUSTRY  
(1929 = 100)

Industry	1934	1936	1937
Building .. .. ..	97.9	113.25	110.0
General engineering, iron and steel founding .. ..	75.6	80.1	90.0
Electrical engineering .. ..	95.4	108.2	128.25
Chemicals .. .. ..	105.0	100.5	110.75
Rubber .. .. ..	68.75	66.8	68.9
Coal-mining .. .. ..	89.9	93.5	93.0
Cotton (spinning and weaving)	97.25	75.0	79.3
Textiles, bleaching, printing and dyeing .. .. ..	88.9	84.5	84.2
Clothing .. .. ..	105.0	103.0	109.0
Distributive trades .. .. ..	108.0	105.5	109.9
All other industry .. .. ..	97.5	106.0	114.8

There has been a substantial decline in the numbers engaged in the rubber industry, although it remains highly concentrated in the Manchester region. One probable reason for this is the decline in the use of rubber-proofed coats, motor cyclists' overalls, etc., due to the increase in popularity of the light car, which during this period replaced to some extent the motor cycle and sidecar.

[288]

The trends of the numbers of persons employed in the leading industries in the region over this period have also been considered in relation to the national trends. As the numbers employed in the clothing industry rose, so did the location index, indicating that the rate of expansion of this industry in the region was ahead of the national rate. From 1934 onwards the number of persons engaged in general engineering increased, but this increase was below the national rate of expansion. Consistently high location indices prevail in the electrical engineering, rubber, textile and clothing industries.

[289]

The general depression of 1931, and the consequent serious drop in exports, hit the basic industries hardest (i.e. cotton, coal, iron and steel), with the result that labour was forced to seek employment in other industries. However, the majority of these latter industries were so intimately connected with the cotton and textile engineering industries that, although employment in them rose, their recuperation from general depression was slower than in the country as a whole.

[290]

**Table 2**  
**ESTIMATED NUMBERS AND PERCENTAGES OF TOTAL INSURED EMPLOYED (MALES AND FEMALES) IN EACH INDUSTRY IN THE REGION, TOGETHER WITH THE CORRESPONDING LOCATION INDICES FOR THE YEARS 1929, 1934, 1936 and 1937**

Industry	1929			1934			1936			1937		
	Insured employed	Percent-age of region	Loca-tion index	Insured employed	Percent-age of region	Loca-tion index	Insured employed	Percent-age of region	Loca-tion index	Insured employed	Percent-age of region	Loca-tion index
Building .. ..	20,415	4.64	0.67	19,920	4.65	0.65	23,150	5.27	0.68	22,455	4.79	0.67
General engineering, iron and steel founding .. ..	30,810	6.95	1.41	23,375	5.44	1.32	24,580	5.63	1.28	27,753	5.95	1.25
Electrical engineering .. ..	16,623	3.76	5.05	15,830	3.70	4.77	18,152	4.14	6.50	21,448	4.60	4.83
Chemicals .. ..	6,724	1.52	1.67	7,094	1.65	1.89	6,782	1.54	1.89	7,444	1.59	1.89
Rubber .. ..	13,741	3.10	5.65	9,450	2.20	3.89	9,188	2.10	4.94	9,478	2.03	4.15
Coal-mining .. ..	5,150	1.16	0.147	4,630	1.08	0.18	4,820	1.10	0.19	4,800	1.03	0.17
Cotton (spinning and weaving)	41,160	9.32	2.16	40,030	9.37	2.89	30,840	7.07	2.33	32,610	7.00	2.36
Textiles (bleaching, printing and dyeing) .. ..	15,910	3.60	4.06	14,185	3.28	4.32	13,420	3.06	4.26	13,150	2.78	4.09
Clothing .. ..	37,417	8.45	2.54	39,261	9.18	2.77	38,506	8.92	2.76	40,659	8.70	2.84
Distributive trades .. ..	75,110	17.20	1.12	81,100	18.95	1.13	78,630	17.93	1.12	82,790	17.70	1.14
All other industries .. ..	178,160	40.30	0.74	173,550	40.50	0.72	188,550	43.24	0.76	204,910	43.83	0.76
<b>Totals ..</b>	<b>441,220</b>	<b>100.00</b>		<b>428,425</b>	<b>100.00</b>		<b>436,618</b>	<b>100.00</b>		<b>467,497</b>	<b>100.00</b>	

The significance of these factors is increased by the importance of manufacturing industries to the prosperity of the regional area. The 1931 Census of Industry shows that whereas 23.5 per cent of the total population were engaged in productive industry in England and Wales, the figure for manufacturing industry was only 13.0 per cent. In the regional area the corresponding percentages were 37.6 and 25 respectively. That is to say, the proportion of the total population employed in manufacturing industry was nearly double that so employed nationally. It is thus of vital importance that, during times of depression in its major industries, the prosperity of the region should not be jeopardised through lack of other industries. [291]

Industries which could, with advantage, be more highly located in the regional area are:

- (a) All trades allied to the building industry, including the manufacture of plastics, prefabricated building units, patent wall boards, and special forms of glass.
- (b) The food, drink and tobacco industries. Within this category fall patent foods, soft drinks and medicinal foods, whose production would be assisted by the existing chemical industries in the region.

(c) The heavier and the lighter types of engineering, including constructional engineering, heavy castings and the manufacture of precision tools, particularly hand-tools and instruments.

(d) Leather and allied trades.

(e) Sections of the textile industry, other than cotton and its allied trades. In this category will fall many new industries, such as nylon, spun glass, etc.; but if the cotton trade is to be expanded or even maintained, it must not be jeopardised by a loss of skilled operatives, male or female, to such industries as these. [292]

#### INDUSTRIAL STRUCTURE OF THE LOCAL GOVERNMENT AREAS

In the areas of the local authorities within the region, and especially in those of the smaller authorities, there has not been sufficient diversification of industry to give reasonably balanced employment. Lack of balance in the area of any one local authority in the region is not necessarily fatal, but it does tend to increase travel to and from work in times of unbalanced trade. It is certainly advantageous to obtain a balance or an approximate balance, if this can be done without

detriment to existing industries which are dependent upon one another for their prosperity. [293]

In seven of the 14 districts, more than 20 per cent of the employed population in 1931 were employed in one industry, the staple industry in five cases being cotton. The highest percentage was in respect of the clothing (hat) industry at Denton (37.3 per cent). Cotton employees were mainly concentrated at Droylsden, Middleton, Swinton and Pendlebury, Worsley and Failsworth. Coal is mainly worked in

the Swinton and Pendlebury and Worsley districts. [294]

Table 3 shows the percentages of persons employed in the principal industries in the area of each district in the region based upon the 1931 Census of Industry tables. The percentages of persons employed in the distributive trades is not shown as this is fairly constant in all districts, ranging from 18 to 20 per cent. (See also Fig. 17.)

[295]

Table 3 INDUSTRIAL STRUCTURE

MANCHESTER C.B.		SALFORD C.B.	
Employed 342,730		Employed 100,544	
	per cent		per cent
Clothing	12.2	Clothing	11.1
Hotels and catering	8.5	Hotels and catering	7.5
Cotton	4.5	Cotton	6.3
Printing, paper, etc.	4.1	Electrical engineering	5.1
General engineering	3.7	Printing, paper, etc.	4.3
Building and contracting	3.4	Textiles	3.9
Textiles	2.4	General engineering	3.2
Electrical engineering	2.3		
ECCLES M.B.		MIDDLETON M.B.	
Employed 19,748		Employed 13,995	
	per cent		per cent
Cotton	8.4	Cotton	34.25
General engineering	5.9	Textiles	16.4
Electrical engineering	3.7	Food	5.4
Food	3.7	Building	3.75
STRETFORD M.B.		SWINTON AND PENDLEBURY M.B.	
Employed 26,775		Employed 15,540	
	per cent		per cent
Electrical engineering	13.1	Cotton	22.3
Clothing	5.5	Coal-mining	15.6
Construction and repair of vehicles	4.1	Building	5.25
Food	3.5	Electrical engineering	4.9
DENTON U.D.		DROYLSDEN U.D.	
Employed 8,634		Employed 6,070	
	per cent		per cent
Clothing (hats)	37.3	Cotton	23.75
Cotton	7.1	Engineering	7.05
General engineering	4.9	Food	5.4
Electrical engineering	3.9	Textiles	5.4
IRLAM U.D.		URMSTON U.D.	
Employed 5,863		Employed 4,223	
	per cent		per cent
Iron and steel	20.6	Electrical engineering	12.25
Grease, glue, soap, etc.	15.3	Building	4.6
Food	9.9	Clothing	4.0
Building	5.15	Food	3.57
WORSLEY U.D.		FAILSWORTH U.D.	
Employed 7,010		Employed 7,478	
	per cent		per cent
Cotton	25.0	Cotton	26.7
Coal-mining	20.1	Electrical engineering	12.15
Building	4.9	Clothing	8.04
Clothing	3.6	Coal-mining	3.43

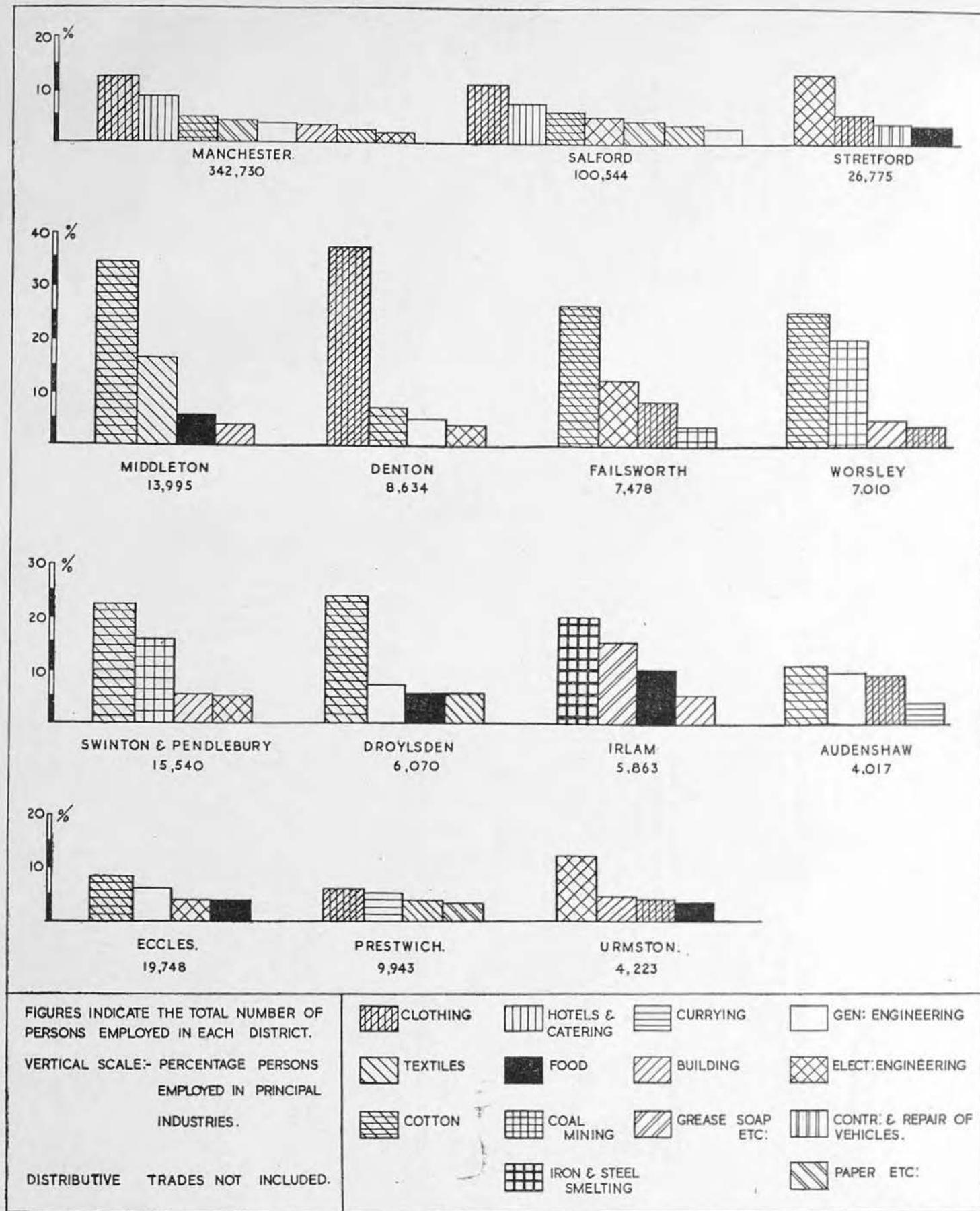


Fig. 17. INDUSTRIAL STRUCTURE of the districts in the region showing the percentages of employed persons in the principal industries according to the 1931 census.

Table 4 INDUSTRIAL SURVEY—REGIONAL AREA. PRODUCTIVE INDUSTRIES

Local authority	Industrial characteristics		No. of factories and employees 1943		Characteristics of population i.e. whether principally living and working in borough, leaving or entering to work	General remarks
	Principal industries according to numbers employed	Size of factories	Factories	Employees		
MANCHESTER	Clothing, cotton printing, paper and general engineering	Clothing has a large number of small factories. Engineering has a number of large factories. Other industries evenly distributed—large, medium and small	4,688	157,368	Large number enter to work although majority live and work in city	Principal industries are old and well-established. A tendency for industry to move out of the inner city areas is notable, although a number, tied by their process requirements and circumstances, remain in an inner ring surrounding the main core of the cities of Manchester and Salford
SALFORD	Clothing, cotton, electrical engineering, printing and paper	Clothing has a number of small factories, although proportionately less than Manchester. There are two large electrical works in the city, but other industries are mostly medium and small	868	41,115	More leave than enter to work, although majority live and work in the city	Principal industries adjacent to the docks and river frontage, adding to the ring surrounding the main core of the two cities. The lighter industries give useful employment to female labour and expansion of the electrical industry has resulted in increased employment generally
ECCLES	General engineering, cotton, electrical engineering, heavy engineering and food	General engineering, cotton and heavy engineering have a number of large factories. Other industries, including food, mostly medium and small	175	10,442	Formerly more left than entered to work, but as a result of expansion of engineering industry it is estimated that the reverse is now true. Majority live and work in borough	Principal industries located on outskirts of main urban area with a tendency to follow the canal. Expansion of the electrical and heavy engineering industries has resulted in increased employment
MIDDLETON	Cotton, textiles, food and general engineering	Cotton and textiles have a number of large factories. Other industries, including food, mostly medium and small	139	7,486	More leave than enter borough to work, but majority live and work there	Principal industries have tended to develop "ribbonwise" along the valley adjacent to the main road. Since the outbreak of war an expansion of the general engineering industry has resulted in a more balanced industrial structure
PRESTWICH	Textiles, chemicals and timber	The three principal industries have large factories; other industries are small	57	1,490	More leave than enter to work	Borough primarily a residential dormitory area. Existing industry dispersed with main factories located at some distance from residential development
STRETFORD	Electrical and general engineering, food and chemicals	Both electrical and general engineering have very large factories. Food and chemicals have large factories but other industries mostly medium and small	313	56,193	More enter borough to work. The number living and working in borough and number entering is approximately equal. A minority leave to work	Borough contains part of existing industrial estate of Trafford Park. Industry in estates and neighbourhood has expanded considerably although some tendency for industry not tied to canal and docks to leave borough
SWINTON AND PENDLEBURY	Chemicals, cotton, general engineering, mining and building	Chemical industry has one very large works. Cotton, general engineering and building have a number of large factories. Other industries all small	135	8,544	Formerly more left than entered to work, but conditions now may be equal or even reversed. Majority live and work in borough	Borough contains extensive colliery workings. Principal factories evenly distributed through an area dissected by the railways and main road

Table 4 INDUSTRIAL SURVEY—REGIONAL AREA. PRODUCTIVE INDUSTRIES (continued)

Local authority	Industrial characteristics		No. of factories and employees 1943		Characteristics of population i.e. whether principally living and working in borough, leaving or entering to work	General remarks
	Principal industries according to numbers employed	Size of factories	Factories	Employees		
AUDENSHAW	General and heavy engineering, food and leather working	Engineering has a number of large factories. Food and leather each have one large factory. Other industries all small	60	4,484	Formerly a few more left to work than entered the district. Present conditions cannot be estimated accurately, but majority live and work there	Owing to concentration of cotton industry, apparently in other areas, and entry of some large engineering firms, industrial structure of district has changed. Industry is generally widely dispersed and bears more relation to industry in neighbouring areas than to district itself
DENTON	Electrical engineering, clothing, general engineering and rubber	Electrical engineering has one very large factory. Clothing, general engineering and rubber have a number of large factories. Others are small	104	5,818	More leave than enter to work but majority live and work there	War-time influences have resulted in expansion of engineering industry at expense of clothing (hats). Existing industry located around intersection of two main roads with some concentration towards district centre
DROYLSDEN	Cotton, clothing, chemicals, general engineering and textiles	Principal industries have large factories. Other industries all small	71	2,342	Majority live and work in district. Formerly a few more left to work than entered, but present conditions may have changed this characteristic	Chemical industry has recently expanded in district; other principal industries are old and well-established, but have developed "ribbon-wise" alongside the canal
FAILSWORTH	Electrical engineering, cotton, general engineering and clothing	Electrical and general engineering each have one very large factory. Cotton and clothing have large factories. Others evenly distributed large, medium and small	79	9,096	More enter than leave district but majority live and work there, although this majority may now be comparatively small	Engineering industries have recently expanded at expense of old-established cotton industry and have increased import of workpeople into district. Existing industry located adjacent to main road with a concentration immediately S.W. of district centre
IRLAM	Iron and steel, chemicals, food and general engineering	Iron and steel has one very large factory. Chemicals, food and general engineering have large factories. Other industries all small	28	5,435	More enter than leave district to work. Number entering now probably exceeds number living and working there	District contains largest iron and steel smelting firm in region, which is old-established, being tied to railway, canal and wharf facilities. Other industry widely dispersed in large factories but similarly related to canal and railway
URMSTON	General engineering, chemicals, heavy engineering and building	All principal industries have very large factories. Other industries are mostly small	107	15,128	More enter than leave district to work, but majority live and work there	District contains that part of Trafford Park in which principal industries are located. Some tendency to spread outside the Park, mainly as a result of war-time expansion. Other industry mostly dispersed in medium and small factories outside residential areas
WORSLEY	Clothing, cotton, electrical engineering, and coal-mining	Clothing and electrical engineering have three very large factories. Cotton has some large factories, but other industries are all small	71	10,147	More enter than leave district to work, but majority live and work there	District contains five important colliery workings. Other industry dispersed but located in two groups adjoining main road with a further concentration near Walkden centre. Establishment of two large clothing factories and one electrical engineering works has changed the industrial structure of the district in recent years

## SURVEY OF PRODUCTIVE INDUSTRIES

From information supplied by H.M. Inspectors of Factories it has been possible to make a comprehensive survey of the location and types of factories in the regional area. This survey is in respect of the year 1943 and relates to productive industries only; it does not take into account persons in commerce, transport, the distributive trades, etc. The industrial characteristics of each district are set out in Table 4. [296]

Throughout the region there are 6,895 factories, approximately 83 per cent of which employ less than 100 persons each. The industry with the largest number of factories (1,241) is the clothing industry. Table 5 indicates the numbers of factories, and Table 6 the numbers of persons engaged in productive industries in the area of each local authority. [297]

Table 5 FACTORIES ENGAGED IN PRODUCTIVE INDUSTRIES, 1943

District	Cotton and general textiles	Rubber and chemicals	Clothing	Building, timber, wood-working	Food, drink tobacco and distributive trades	Engineering	Printing, paper, etc.	General	Total no. of factories
Manchester	394	172	1,040	515	937	772	334	524	4,688
Salford	38	50	115	83	196	205	28	153	868
Eccles	8	5	13	18	61	39	2	29	175
Middleton	28	4	9	14	38	27	5	14	139
Prestwich	4	1	5	7	24	6	3	7	57
Stretford	4	19	8	43	71	118	14	36	313
Swinton and Pendlebury	11	3	5	27	41	34	3	11	135
Audenshaw	—	5	3	8	13	21	—	10	60
Denton	1	6	24	14	17	32	4	6	104
Droylsden	5	4	3	7	32	13	1	6	71
Failsworth	12	8	1	8	22	15	4	9	79
Irlam	—	3	—	4	8	8	2	3	28
Urmston	—	13	3	20	32	36	—	3	107
Worsley	14	3	12	4	26	7	2	3	71
Totals	519	296	1,241	772	1,518	1,333	402	814	6,895

Table 6 PERSONS ENGAGED IN PRODUCTIVE INDUSTRIES, 1943

District	Cotton and general textiles	Rubber and chemicals	Clothing	Building, timber, wood-working	Food, drink, tobacco and distributive trades	Engineering	Printing, paper, etc.	General	Total No. of persons employed
Manchester	17,624	12,705	30,781	5,030	12,732	64,111	9,357	5,028	157,368
Salford	3,678	4,687	7,258	1,699	2,462	15,170	393	5,768	41,115
Eccles	798	503	63	88	705	7,879	4	402	10,442
Middleton	4,941	439	216	60	943	699	21	167	7,486
Prestwich	690	250	112	139	90	33	11	165	1,490
Stretford	744	1,736	150	1,761	2,109	48,469	588	636	56,193
Swinton and Pendlebury	3,130	2,051	8	1,393	259	1,618	3	82	8,544
Audenshaw	—	195	131	78	549	3,225	—	306	4,484
Denton	25	200	2,061	130	190	3,164	16	32	5,818
Droylsden	989	369	304	33	126	247	1	273	2,342
Failsworth	2,455	439	750	39	384	4,732	144	153	9,096
Irlam	—	1,033	—	33	548	3,729	57	35	5,435
Urmston	25	2,585	4	811	327	7,956	59	3,361	15,128
Worsley	3,009	117	4,321	35	253	2,383	2	27	10,147
Totals	38,108	27,309	46,159	11,329	121,677	163,415	10,656	6,435	335,088

## MOVEMENT OF INDUSTRIAL POPULATION

Consideration has been given to the extent to which daily movement of the industrial population takes place within the regional area. The only definite source of information, however, has been the 1921 Census of Workplaces; although such information has obvious limitations it does give a striking indication of the movement taking place. With a continuing migration of the population since 1921 to the outer districts of the regional area and beyond, daily movement at the present time must show a substantial increase over the 1921 figures. [298]

The following extract from the preface to the 1921 Census of Workplaces is worth noting, being essentially true of past development in the Manchester region:

The growth of large manufacturing, distributing, and commercial centres has not only given rise to concentration of workers beyond the residential capacity of their immediate neighbourhoods, but has exaggerated that deficiency by substituting factories, warehouses and offices for dwellings in the centres themselves; while the very development of transport which has made it necessary for the worker to live at a distance from his work has also made it possible for him to do so. [299]

One of the advantages of modern transport facilities is undoubtedly the wide measure of choice of employment it permits, but travelling can be reduced by a careful distribution of industrial units, and further reduced when housing

provisions enable workpeople to choose dwellings near their workplaces, if they so desire. It is appreciated, of course, that many people will live in certain districts on account of home ties and will travel considerable distances rather than move to new environments. Nevertheless, for healthy and economic working conditions, the cost of travel must be cut down, the time taken in getting to work reduced, and the exhaustion and fatigue due to travel eliminated. A satisfactory regional distribution of industry will go far to meet these needs. [300]

Tables 7, 8 and 9 give details for the year 1921 of:

- (1) the number of employed persons travelling daily into and out of each district in the regional area to and from their place of work.
- (2) the daily movement to and from Manchester.
- (3) the daily movement to and from Salford. [301]

It will be noted that 117,194 persons travelled to work in Manchester at the time of the census (1921), of whom 54,836 were from districts outside the regional area. [302]

The redevelopment of the congested residential areas will accentuate the desirability of decentralising certain industries to minimise the time and money spent in travel; the industrial zoning proposals (see below) have been formulated with this in view, providing a greater flexibility of industrial zoning in the outer areas. [303]

Table 7  
DAILY MOVEMENT OF INDUSTRIAL WORKERS, 1921, TO AND FROM DISTRICTS IN THE REGION

<i>District</i>	<i>Occupied persons residing in the district</i>	<i>Persons working outside the district</i>	<i>Persons travelling into the district to work</i>	<i>Increase over or decrease in resident employed population</i>
Manchester	364,499	42,250	117,194	+ 74,944
Salford	114,867	49,017	21,182	- 27,835
Eccles	21,616	8,678	2,608	- 6,070
Middleton	15,522	4,155	2,770	- 1,385
Prestwich	7,971	4,505	1,028	- 3,477
Stretford	23,839	11,979	21,965	+ 9,986
Swinton and Pendlebury	15,251	6,646	3,467	- 3,179
Audenshaw	4,082	2,666	1,740	- 926
Denton	9,661	3,995	2,397	- 1,598
Droylsden	7,097	3,709	2,731	- 978
Failsworth	8,991	3,885	4,079	+ 194
Irlam	4,391	371	3,238	+ 2,867
Urmston	8,758	5,708	8,137	+ 2,429
Worsley	7,175	2,929	4,442	+ 1,513

Table 8

## DAILY MOVEMENT OF INDUSTRIAL WORKERS TO AND FROM MANCHESTER

District	Persons travelling to work in Manchester from district	Persons travelling to district from Manchester
Salford	33,789	11,694
Eccles	3,484	361
Middleton	1,379	1,318
Prestwich	3,142	187
Stretford	9,062	8,524
Swinton and Pendlebury	1,516	285
Audenshaw	649	226
Denton	1,318	448
Droylsden	2,782	1,431
Failsworth	2,207	1,825
Irlam	168	280
Urmston	2,152	848
Worsley	710	36

Number of persons working in Manchester and residing in other districts in the region ... 62,358

Table 9

## DAILY MOVEMENT OF INDUSTRIAL WORKERS TO AND FROM SALFORD

District	Persons travelling from district to work in Salford	Persons travelling to district from Salford
Manchester	11,694	33,789
Eccles	1,703	939
Middleton	141	81
Prestwich	525	249
Stretford	1,287	7,094
Swinton and Pendlebury	1,115	1,731
Audenshaw	31	—
Denton	45	—
Droylsden	65	31
Failsworth	67	39
Irlam	—	155
Urmston	240	1,495
Worsley	138	73

## THE INDUSTRIAL QUESTIONNAIRES

One planning problem which should undoubtedly receive early attention after the war is the necessity for the future redevelopment of the congested residential areas, with a consequent decentralisation or dispersal of a substantial part of the overcrowded populations. [304]

There are many industrial undertakings at present housed in premises which will, in due course, be no longer suitable for their requirements, or which will not permit of desirable expansion. Even undertakings which are more favourably placed may find it advantageous, when the time for rebuilding comes, to move to new sites where land can be cheaply leased, an open, healthy form of development obtained, room reserved for future expansion, and good facilities for road and/or rail transport secured. [305]

Just as modern standards of housing necessitate the decentralisation or dispersal of overcrowded populations, so will modern requirements in regard to healthy and efficient working conditions make it desirable that some industrial development should be re-sited when the time for redevelopment arrives. In any case, a large number of industrial undertakings are at present situated in congested residential areas. These will have to be moved in due course if such areas are to become desirable residential districts worthy of the large expenditures which their redevelopment must necessarily entail. [306]

Parallel dispersals of population and industry must be encouraged so that the dispersed people may have the advantage of living within reasonable distance of their employment, thereby minimising fatigue from long travelling hours and the costs involved. [307]

In order to obtain full information on the existing industrial structure, industrial questionnaires were prepared in collaboration with the Industrial Sub-Committee of the Manchester Chamber of Commerce Planning Consultative Committee. [308]

Questionnaire A, with an accompanying letter (Appendix 2), has been framed in order that the replies might give an indication of the problems and difficulties resulting from the possible dispersal of particular industries, and has been circulated to industrial undertakings in likely or proposed residential zones and redevelopment areas. [309]

Questionnaire B (Appendix 2) is the general questionnaire used to obtain detailed information of the complicated industrial structure of the region, and to ascertain the extent to which planning may assist industry in general and particular industries in the matter of new sites, encourage-

ment of linked and ancillary industries, facilities for transport, etc. [310]

The information so obtained supplements that already provided by the industrial surveys. [311]

### TRAFFORD PARK

The Trafford Park trading estate at the eastern terminus of the Manchester Ship Canal constitutes the industrial centre of the region, and provides employment for a large proportion of the industrial labour. Before the war, the estate railways carried more than two million tons of traffic per annum—equivalent to over three per cent of the total merchandise traffic passing on all the railways in Great Britain. [312]

Owing to the importance of such an estate (some 1,200 acres in extent) in the heart of the region, a special survey of its industries has been undertaken and a questionnaire (Form "B") has been sent to each of the industrial firms located there. [313]

Factors of note which have come to light as a result of this survey are:

- (1) The relatively high proportion of female labour employed in the electrical engineering, abrasives, and food and drink industries, viz., 20, 24 and 40 per cent respectively.
- (2) The high proportion of unskilled to skilled operatives in the chemical industry and its allied industry, oil and grease refining.
- (3) The highest proportion of machinists is in the road haulage industry (84 per cent), no doubt on account of the large number of driver-mechanics.
- (4) Industries with a relatively high proportion of machinists are the rubber, abrasive and heavy engineering industries. Engineering generally shows a low proportion (nine per cent), although the even use of unskilled and skilled workers forming the bulk of the operatives is noticeable. [314]

Among the firms with important works in the Park which are tied to dock facilities are flour millers and grain storagers, oil refiners and grease manufacturers, certain chemical manufacturers such as starch and dextrine processors, and timber merchants. [315]

Advantages offered by a situation in the Park are the facilities afforded for the disposal of effluent and the success of artesian-well borings into the

sandstone strata which underlie the superficial drift soils in this area. [316]

The high proportion of undertakings stating that there is no need for the establishment of any linked industries in the area would seem to indicate that industries are generally well balanced. One exception to this is apparently a need for more firms manufacturing packing materials, such as fibreboard and paperboards, and making them up into cartons. This may be considered of some importance in view of Manchester's position as a warehousing centre for the manufacturing industries of the region. [317]

There are several conclusions to be drawn from information obtained in the course of the survey. [318]

First and most important is the fact that public transport conditions and means of egress and ingress in the area of the estate have reached such a state of congestion as to constitute a menace to the well-being of the employees. This problem has, no doubt, been aggravated by increased employment in the Park industries during the war. The question of traffic access has received careful consideration and is discussed in detail in Chapter VII. [319]

The second conclusion is that since the particular industrial structure of the Park has been built up as a result of the value of its dock, rail and transport facilities, the satisfactory functioning of these facilities should have prime consideration in any replanning of the Park and its immediate neighbourhood. [320]

Thirdly, since the area has been reserved for industry and offers advantages of particular interest to special industries, to which objection might be made in other urban areas, any restriction on the development of this type of industry in the Park would be inadvisable. [321]

From the point of view of its industrial structure, the Park differs somewhat from other trading estates, particularly those established for the purpose of rehabilitating industry in the special areas. In all other large trading estates the lighter types of industry predominate; examples are printing, foodstuffs, electrical components and radio, building blocks and special chemicals at Welwyn; engineers' patterns, motor components, scientific instruments, clothing and textiles at Letchworth; clothing, confectionery, fibreboard, furniture,

motor bodies and potato crisps at Team Valley; and confectionery, moulded toys, coated cardboard and paper, electrical products, fine leather, lock-knit fabrics, electric storage batteries, etc., at Treforest. [322]

While the Ship Canal and dock facilities have tended to attract the heavier types of industry to Trafford Park, promoters of industrial estates attached to garden cities have been concerned to restrict industrial development to the lighter types in the interests of general amenity. In the case of estates established by the Government in special

populations have been decentralised, in order to give opportunity for work within reasonable distance of home. [324]

An analysis of the types of labour engaged in the principal industries in the Park is given in Table 10. [325]

### INDUSTRIAL ZONING

Although the conditions and processes of industry are constantly changing, it is only from what exists at the moment that a framework for the future can be derived. While statistics relating to

Table 10 LABOUR ANALYSIS—COMPOSITION PRE-WAR (1937). TRAFFORD PARK (MALES AND FEMALES)

Industry	Percentage unskilled M. F.		Percentage skilled M. F.		Percentage machinists M. F.		Percentage clerical M. F.		Percentage of female employees
Lead .. .. ..	26	—	44	—	13	—	15	2	2
Structural steelwork .. ..	28	—	42	—	7	—	17	6	6
Motor engineering .. ..	14	—	67	—	8	—	7	4	4
Electrical engineering .. ..	Detailed composition of major firms not stated								20
Reinforced concrete engineering ..	25	—	63	—	2	—	7	3	3
Mechanical and general engineering	48	—	32	—	5	—	11	3	4
Aircraft and special engineering ..	35	—	55	—	2	—	3	2	5
Heavy engineering .. ..	34	—	31	—	23	—	8	4	4
Average engineering .. ..	30	1	47	—	9	—	10	3	4
Oil refining and grease .. ..	40	9	27	1	2	—	14	7	17
Food and drink .. .. ..	33	13	20	—	3	20	4	7	40
Flour milling .. .. ..	29	8	43	—	3	—	14	3	11
Chemicals .. .. ..	40	—	23	—	4	—	26	7	7
Abrasives .. .. ..	15	2	9	3	36	9	16	10	24
Timber .. .. ..	40	—	16	—	20	—	22	2	2
General building .. .. ..	43	—	36	—	8	—	10	3	3
Road haulage .. .. ..	10	—	—	—	84	—	4	2	1
Rubber .. .. ..	30	—	15	—	42	—	11	2	2
Warehousing .. .. ..	46	5	14	—	15	—	18	2	7
Average composition of all firms in the park .. .. ..	35	3	30	—	11	1	15	5	9

areas, since the predominance of basic industries tied to mineral resources was responsible for their distress, it was equally essential to restrict further industrial development to the lighter types in order to promote a more balanced structure. [323]

It would, therefore, appear that the more advantageous policy for the future development of Trafford Park would be to encourage the expansion of basic and special industries. Lighter types of industry should be located in those areas to which

the number of operatives engaged in industry are published in the returns of the Ministry of Labour, the Registrar General, and the Factories Inspectorate, no figures are available relating to the space requirements of industry except on very broad lines. [326]

In an endeavour to assess the extent of future industrial zoning in the region, a survey of the number of employees per acre of industrial development has been carried out (Table 11). [327]

Table 11 SURVEY OF INDUSTRIAL USE OF SPACE

Main	Industry in city area	Employees per acre of floor area	Proportion of site built up	No. of storeys	Average no. of storeys
Main	Sub-division				
Rubber Textiles and cotton	Rubber (including waterproofing of fabrics)	160	0.75	1 to 4	2
	Cotton spinning,				
	Medium .....	50			
	Fine .....	100			
	Raising and finishing .....	40			
	Bleaching and dyeing .....	110			
Other textiles	Rag sorting and waste .....	70	0.65	1 to 5	4
	Cotton waste manufs. ....	140	0.85		
	Quiltings .....	360	0.85	1 to 4	2
	Making up and finishing .....	1,750*	1.00		
Chemicals	Matches .....	215	0.75	1 and 2	2
	Manf. of paint, varnish and spirits .....	165	0.45	1 to 3	2
	Dyestuffs and general chemicals .....	80	0.40	1 to 4	1
Clothing	Distilleries, tar and glycerine, etc. ....	55	0.45	1 and 2	1
	Baby clothing, underwear, etc. ....	2,300*	0.80	1 and 2	1
	Shirtings, etc. ....	800	0.75	1 to 4	2
	Gen. clothing (including waterproof clothing) ....	445	0.90	1 to 5	3
Printing	Finishing, pressing and making up .....	170	0.90	1 to 4	3
	Letterpress printing, newsprinting, etc. ....	115	0.90	1 to 5	5
Laundries	—	285	0.80	and over	
Food, drink and tobacco	Tea mixing, flour blending and currant cleaning .....	1,000	0.35	1	1
	Tobacco .....	435	0.95	1 to 4	3
	Tripe boiling and dressing .....	300	0.75	1 and 2	2
	Bread baking .....	165	0.50	1 and 2	1
	Pickles and sauces .....	110	0.75	1	1
	Lard and edible fats .....	165	0.50	1 to 4	2
	Breweries and bottling (including vinegar) ....	70	0.85	1 to 4	3
Component and light engineering	Gauges and precision tools .....	1,500	0.35		
	Art metal working .....	800	0.35	1 and 2	1
	Tools .....	355	—		
	Engravers to calico printers .....	245	0.80	1 to 3	2
	Nuts and bolts .....	135	0.75	1 and 2	1
Medium engineering	Component parts, etc. ....	230	0.60	1 and 2	2
	Cranes and hoists .....	135	0.75	1 and 2	1
	Textile and bakery engineering				
	Structural steelwork .....	100	0.70	1 and 2	2
	Textile machinists, gas plant, water heaters, etc. ....	57	0.85	1 and 2	2
Forging	—	150	0.60	1 and 2	1
	(Including die casting) .....	100	0.50		
Heavy engineering	Locos, steam hammers, spring and axle manfs. ....	125	0.70	1 to 4	2
Wire-drawing	(Including wire weaving and netting manfs.) ....	210app.	0.75	1 to 3	1
Motor engineering	—	300app.	—	1 to 3	1
Sheet metal	(Including galvanising) .....	235	0.85	1	1
Electrical engineering	General .....	170	0.60		
	Meters and starters, etc. ....	250	0.65	1 to 3	2
	Fittings and parts .....	500	0.35		

All industries—average proportion of site built up — 0.69

\*Note.—To comply with the regulations laid down by the Factories Act, 1937, by which the cubic capacity of air space was increased from 200 cu. ft. to 400 cu. ft. per person, the density of operatives engaged in these industries must be reduced.

The maximum number of operatives at a height of 14 ft. floor to floor (at 400 cu. ft. per person) is 1,560.

Under the Act, firms have five years in which to comply with the space regulations, but, if satisfactory mechanical means of ventilation are introduced, a further five years may be granted before strict compliance becomes essential.

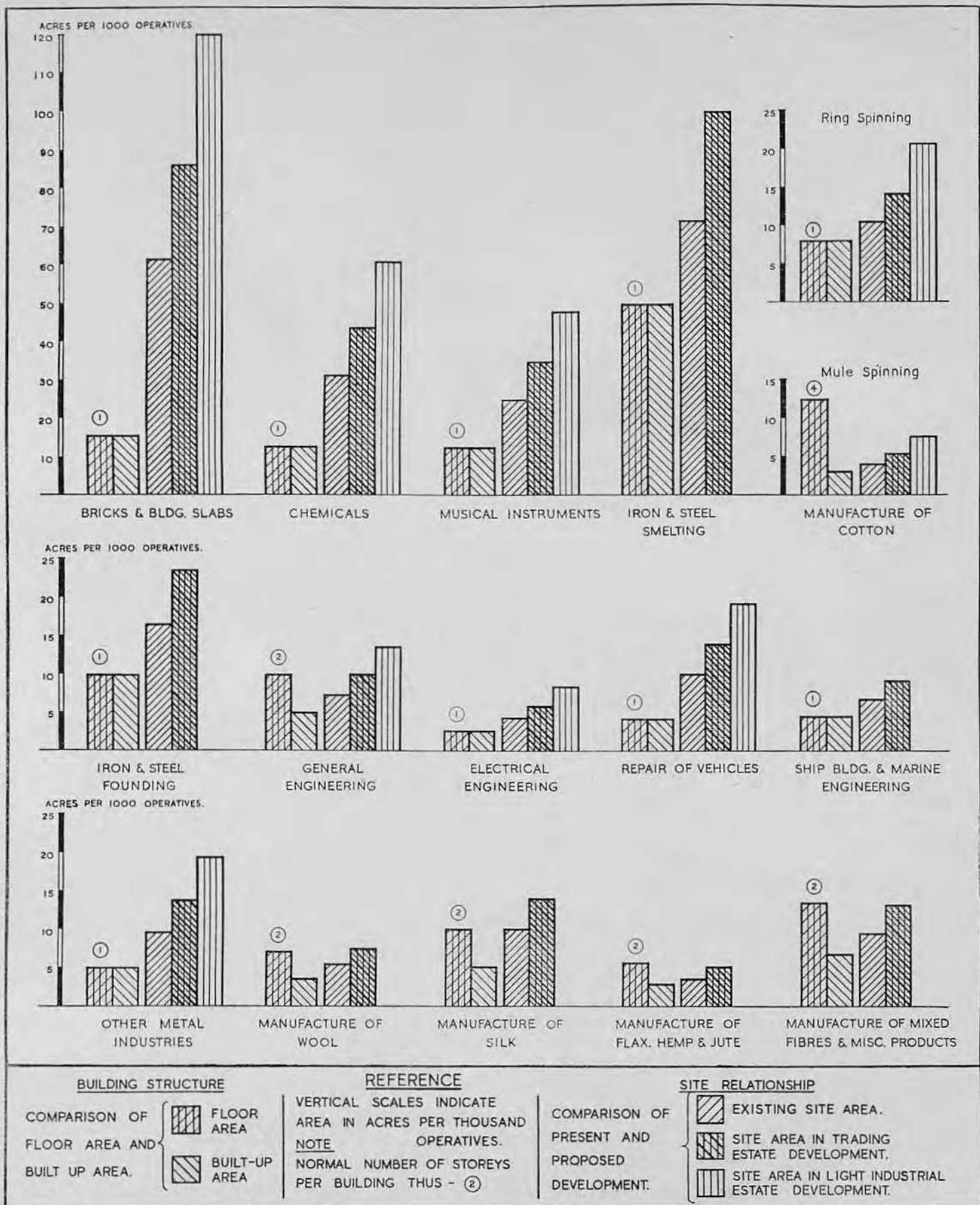
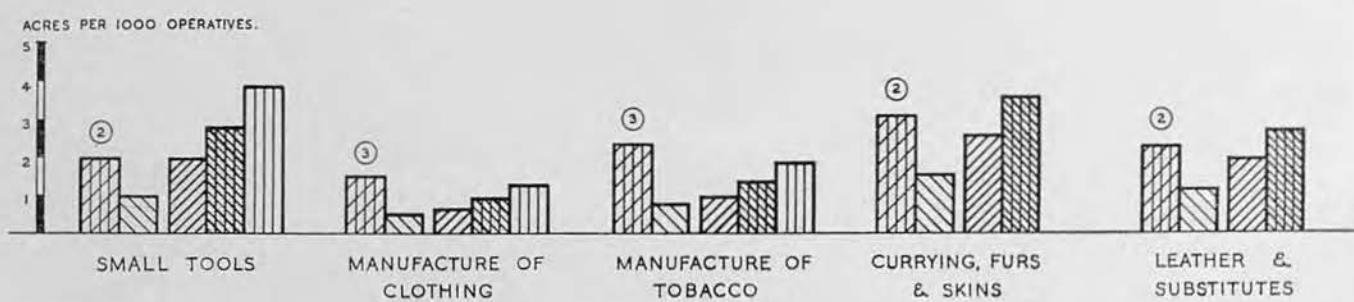
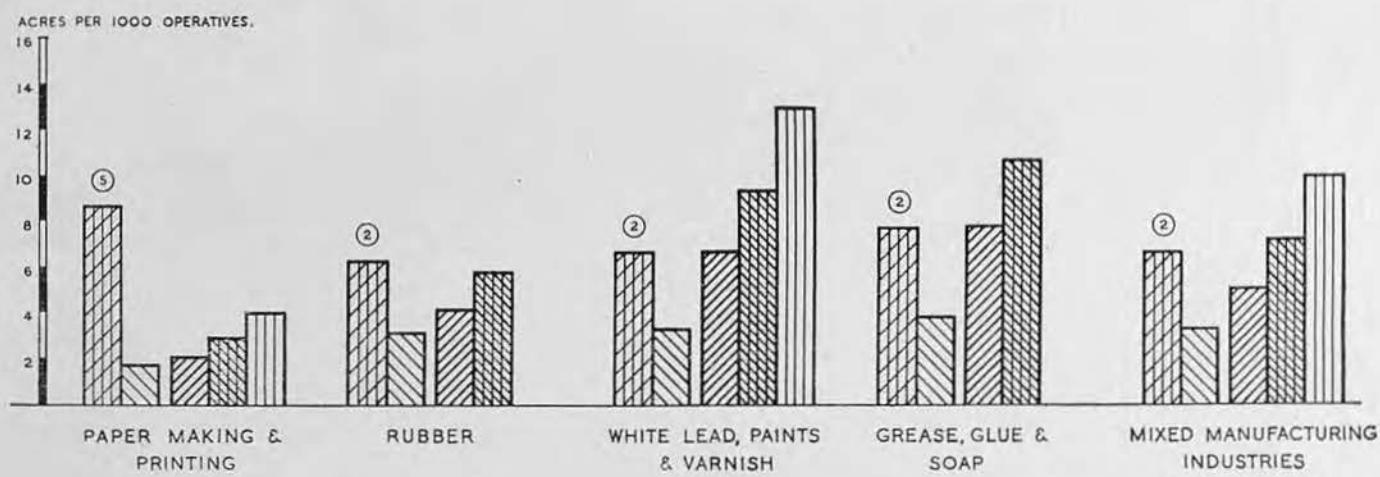
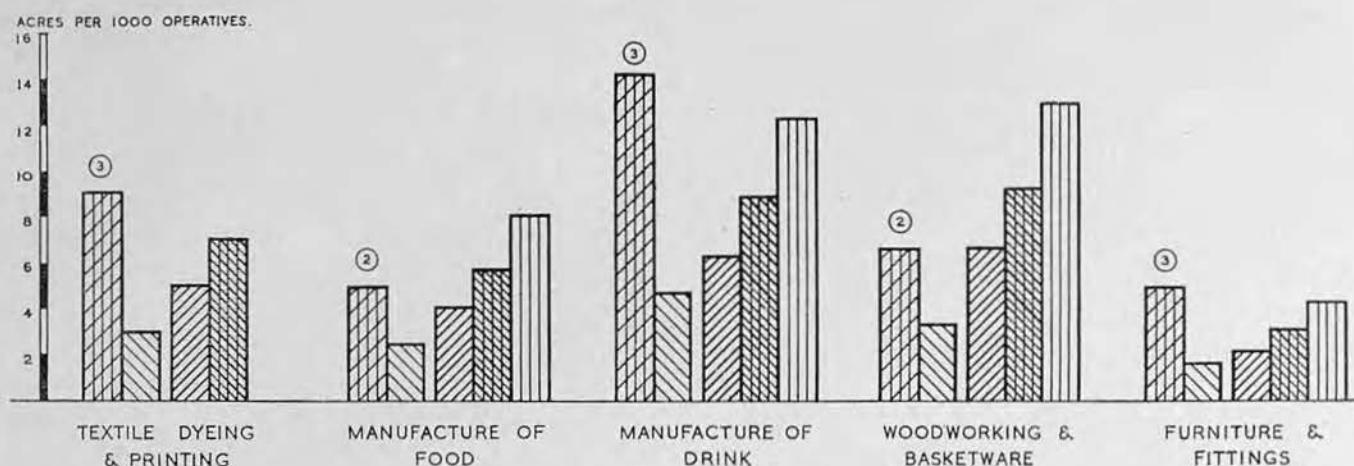


Fig. 18. PRINCIPAL INDUSTRIES—comparison of floor areas and built-up areas, and of the site areas required per 1,000 operatives according to the three standards outlined above.



#### BUILDING STRUCTURE

COMPARISON OF FLOOR AREA AND BUILT UP AREA.



#### REFERENCE

VERTICAL SCALES INDICATE AREA IN ACRES PER THOUSAND OPERATIVES.  
NOTE NORMAL NUMBER OF STOREYS PER BUILDING THUS - (2)

#### SITE RELATIONSHIP

COMPARISON OF PRESENT AND PROPOSED DEVELOPMENT.

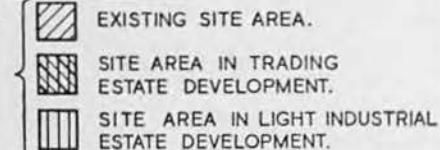


Fig. 18 (continued).

### Use of Space

Space for industry may be divided conveniently into three main categories:

- (a) ground-space occupied by land and buildings together,
- (b) space occupied by buildings only, and
- (c) floor-space within buildings used for industrial processes. [328]

Since the first two categories of space are variable according to circumstantial factors, i.e., economics, structural limitations, etc., and to planning considerations such as transport, space about buildings, etc., all of which originate outside the pale of the industrial structure proper, it is the third category which is of greatest importance, i.e., space provided within industrial buildings for the purpose of carrying on a particular industry efficiently and without waste. The figures set forth in Table 11, obtained by analysis of sample firms in each of the industries, are indicative of the degree of concentration of employees in the industries given. [329]

Density figures calculated in terms of persons per acre of site and of built-up area vary considerably, and have not, therefore, been included in the table. In preference, the proportion of built-up area to site area has been calculated; although this is by no means constant for each sub-division of industry, an average figure is given. The average number of

storeys is also set out, giving a measure of the suitability of each industry for single- or multi-storey development. [330]

Where any industry is already developed at more than one storey, provided that the processes involved are not liable to interfere with the efficient carrying on of other industrial processes accommodated in the same building, such an industry may be regarded as suitable for multi-storey development. This applies generally to the lighter types of industry, such as clothing, printing and electrical and component engineering. [331]

The proportion of built-up area to site area, together with the average number of storeys for each industry, gives an indication of the industrial area required (see Fig. 18, pages 62 and 63). [332]

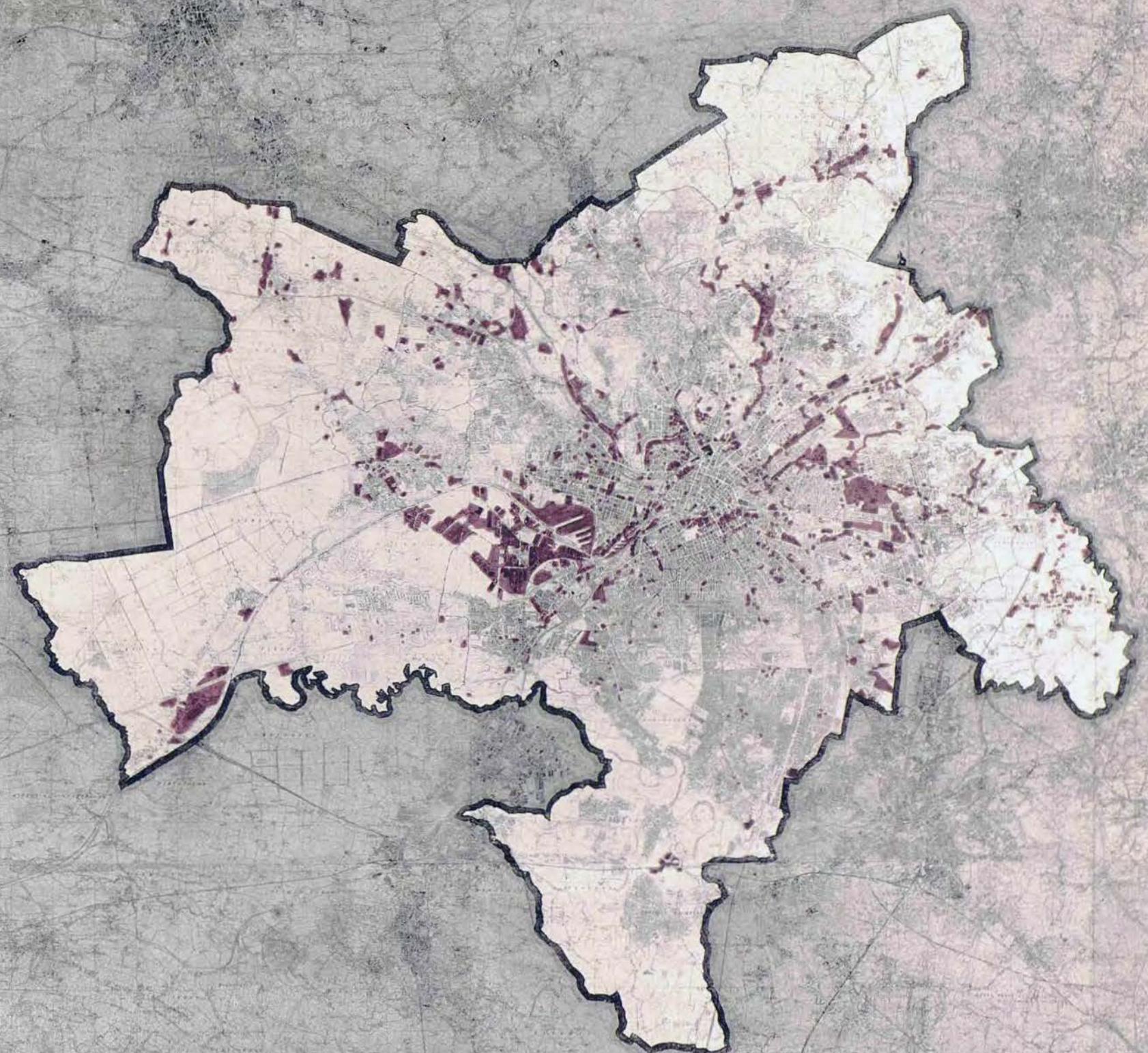
In order to compare the density of industrial development in the Manchester city area with that in more open areas, figures are given in respect of industrial development in Welwyn Garden City and in the Trafford Park trading estate (Table 12). [333]

The figures set forth do not represent ideal conditions; they will not for instance allow for the latest technical developments of processes involved in the various industries, and may even take into account some relatively obsolete processes. However, since it has been possible to determine satisfactory figures in respect of some 200 firms in the

Table 12 COMPARISON OF INDUSTRIAL DENSITIES IN MANCHESTER WITH THOSE IN WELWYN AND TRAFFORD PARK

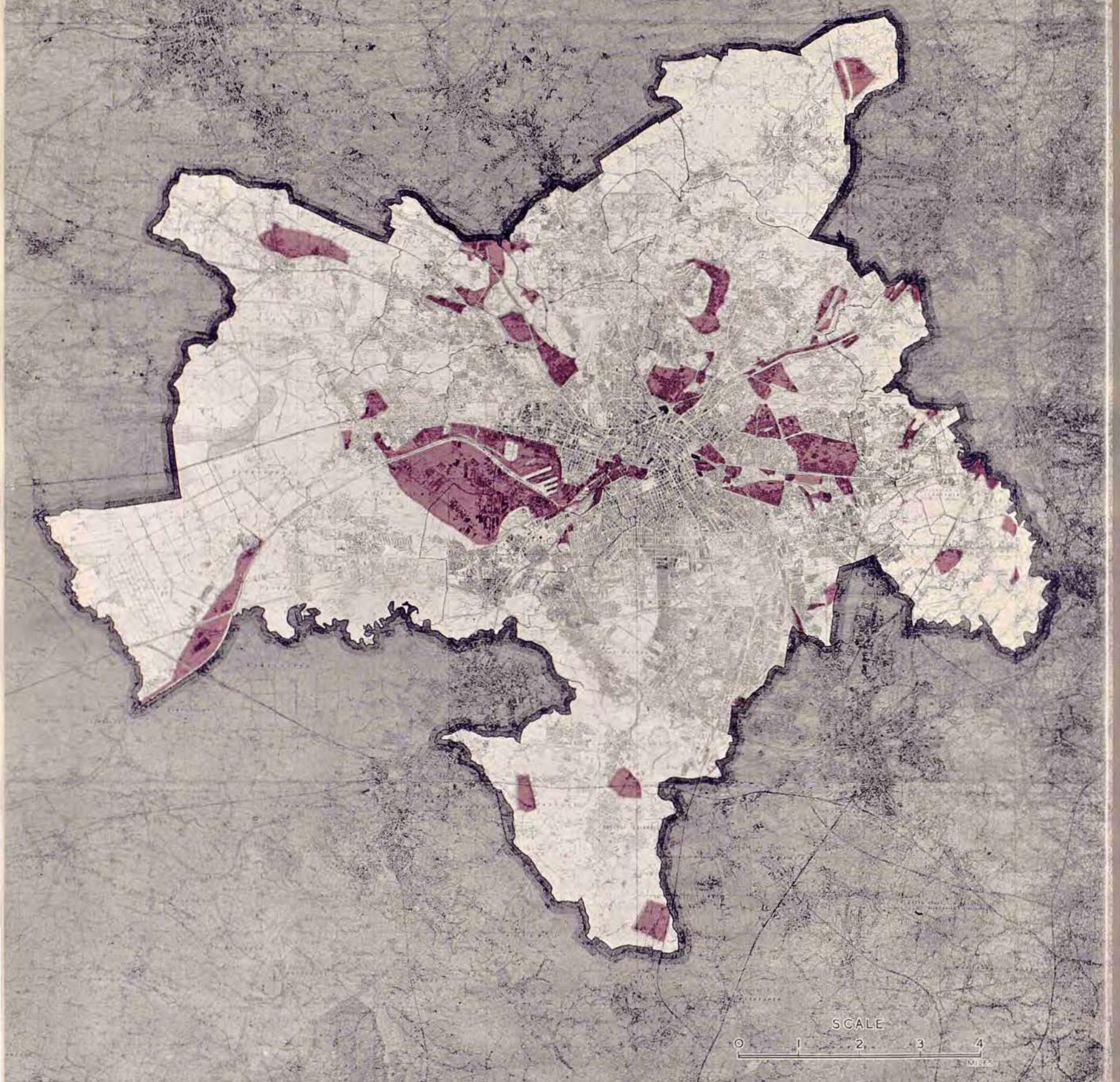
Main	Industry	Persons per acre of floor area		
		Manchester	Welwyn	Trafford Park
Rubber	(Including waterproofing of fabrics)	160	56	—
Component and light engineering	Tools .. .. ..	355	329	—
Medium engineering	Component parts .. ..	230	178	—
	General engineering ..	100	92	33
	Textile machinists ..	57	152	—
Forging	(Including foundry work)	150	100	118
Sheet metal	(Including galvanising)	235	184	178
Motor engineering	—	300	—	237
Electrical engineering	Fittings and parts .. ..	500	432	—
	Motors and components .. ..	250	232	241
Chemicals	Paints, varnishes, spirits and enamels ..	165	99	—
	Dyestuffs and general chemicals ..	80	161	46
Clothing	(Including waterproof clothing)	445	263	—
Food	Bread-baking .. .. ..	165	161	—
Building slabs	—	—	85	48

MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE  
EXISTING INDUSTRIAL AREAS



SCALE  
0 1 2 3 4  
MILES

MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE  
PROPOSED INDUSTRIAL ZONING



Manchester area, and of 48 firms in Trafford Park, in the 16 main industries studied, and since the calculated density of employees apparently approaches a common standard for each subdivision of industry, the density figures arrived at may be considered sufficiently detailed to serve as a guide in determining the extent of future industrial areas. [334]

#### Assessment of future industrial areas

Using the information provided by the survey of employees per acre in industry, it has been possible to arrive at an indication of the extent to which land should be reserved for industry in the region. [335]

From the outset it has been considered that any assessment for industry should preferably be a maximum rather than a minimum so far as the manufacturing requirements of industry are concerned, in order that at least sufficient space for the industrial population of the region might be provided. [336]

At this juncture it may be considered relevant to refer to clause 42 of the Model Clauses, Ministry of Health, 1939, which deals with the proportion of site which may be covered by buildings, and in particular to section three of the clause which makes an exception of industrial and special industrial buildings in certain zones to be specified. Notwithstanding this clause it is deemed essential to prescribe definite limits to the proportion of site which may be occupied by industrial buildings. [337]

The following extract (from "Design of Dwellings", page 63, H.M. Stationery Office) is essentially true in respect of industrial buildings:

The necessity for space about buildings arises from several main considerations—that of having adequate light and ventilation in the building, that of having adequate access, that of preventing the spread of fire, and that of having sufficient space to give adequate outdoor amenities for the inhabitants... [338]

Control of space about industrial buildings may be exercised by either of two methods:

(a) First, on lines suggested in the Model Clauses for zones other than industrial.

The suggestions so made apply to two classes of buildings (i.e., of one storey or less than 30 feet in height, and of more than one storey or over 30 feet in height). Since certain industries, such as clothing and elec-

trical component manufacturing, even on open sites where land values are comparatively low, often prefer to develop their premises to a height of more than two storeys, it is desirable that there should be alternative means of control.

(b) The second and more scientific approach is based upon the principles of daylight penetration into buildings. A floor-space index (the ratio of floor area to area of site) may be prescribed to ensure that work rooms should have at least one per cent of daylight at three-quarters of their depth. [339]

The 1931 Census of Industry has been used as the basis for the assessment of the area required for industry, inasmuch as it was possible to obtain therefrom a detailed classification of the industrial structure of the population of the various districts forming the region. [340]

From the survey of employees per acre in the 16 main industries studied, it has been possible to obtain statistics as to operatives per acre of floor area, number of storeys and proportion of site built upon for each of the 30 manufacturing industries classified by the Minister of Labour. Using these figures as a basis, representative built-up and site areas required by a nominal 1,000 operatives engaged in each of the industries have been calculated. [341]

The areas thus obtained are peculiar, obviously, to conditions in which the survey was carried out, and in view of an anticipated redevelopment of industry giving better working conditions, by the provision of more light and air in and around buildings, it has been considered essential to make allowance for increased site areas. [342]

A means of determining such an allowance has been provided by a comparison of the average proportion of sites built up in the Manchester city area and in Trafford Park. Whereas the proportion for the city area is 0.69, that for the Park is 0.5, i.e., site areas in relation to built-up areas are 40 per cent greater in Trafford Park than in the city. An addition of 40 per cent has, therefore, been made to the site areas calculated for each industry (see column 5A, Table 13). [343]

In many instances in the past an empirical formula of so many acres per thousand of the population has been suggested as a basis for industrial zoning. The wide variations of the figures in

Table 13 PRESENT AND FUTURE AREAS REQUIRED BY MANUFACTURING INDUSTRIES

Industries	(1) Operatives per acre	(2) No. of storeys	(3) Proportion of site built up	(4) Acres of built-up area per 1,000 operatives	(5) Acres of site area per 1,000 operatives	(5A) Acres of site area per 1,000 operatives +40%	(6) Acres of site area per 1,000 of the population
Bricks, glass and building slabs	65	1	0.25	15.4	61.6	86.2	23.6
Chemicals	80	1	0.4	12.5	31.3	43.8	12.0
White lead, paints and varnish	150	2	0.5	3.33	6.66	9.32	2.6
Grease, glue, soap and candles	130	2	0.5	3.85	7.77	10.77	3.0
Iron and steel, smelting	20	1	0.7	50.0	71.5	100.0	27.4
Iron and steel, foundry work	100	1	0.6	10.0	16.7	23.4	6.4
General engineering	100	2	0.7	5.0	7.15	10.0	2.7
Electrical engineering	200	1	0.6	2.5	4.16	5.82	1.6
Repair of vehicles	250	1	0.4	4.0	10.0	14.0	3.8
Shipbuilding, repairing, etc.	110	1	0.7	4.55	6.5	9.1	2.5
Small tools	500	2	0.5	1.0	2.0	2.8	0.8
Other metal industries	200	1	0.5	5.0	10.0	14.0	3.8
Cotton, mule spinning	80	4	0.8	3.13	3.9	5.46	1.5
Cotton, ring spinning	120	1	0.8	8.3	10.4	14.56	4.0
Wool and worsteds	140	2	0.65	3.57	5.5	7.7	2.1
Silk and art. silk	100	2	0.5	5.0	10.0	14.0	3.8
Flax, hemp and jute	170	2	0.8	2.94	3.67	5.14	1.4
Mixed fibres	75	2	0.7	6.66	9.52	13.31	3.7
Textile dyeing, printing and bleaching	110	3	0.6	3.0	5.05	7.06	1.9
Currying, furs and skins	330	2	0.6	1.53	2.53	3.54	1.0
Leather and leather substitutes	440	2	0.6	1.14	1.89	2.65	0.7
Clothing	750	3	0.85	0.51	0.65	0.91	0.3
Food	200	2	0.6	2.5	4.17	5.83	1.6
Drink	70	3	0.75	4.76	6.35	8.88	2.4
Tobacco	435	3	0.8	0.77	0.956	1.34	0.4
Woodworking and timber	150	2	0.5	3.33	6.66	9.32	2.5
Furniture and fittings	200	3	0.75	1.67	2.22	3.11	0.9
Paper-making, stationery and printing	115	5	0.85	1.74	2.05	2.87	0.8
Musical instruments	80	1	0.5	12.5	25.0	35.0	9.6
Rubber	160	2	0.75	3.13	4.16	5.82	1.6
Mixed manufacturing industries	150	2	0.65	3.33	5.14	7.2	2.0

column 6 (Table 13), clearly indicate the difficulty of applying such a formula. [344]

The ultimate population to be provided for has been based on the number of dwellings existing in the region after the application of standards of development and redevelopment allowing for the redevelopment of all areas exceeding a density of 24 houses per acre and allowing 3.25 persons for each dwelling. Although the average number of persons per house over the region as a whole before the war was 3.5, the adoption of a lower figure is supported by the likelihood that in the future there will be a larger proportion of the elderly or young unmarried people living in separate units, as a matter of choice, when such accommodation becomes available. [345]

The ultimate industrial population has been estimated for each district and divided up in proportion to its probable industrial composition. Columns 6 and 7 of Table 14 set out the percentages of persons employed in respect of (a) manufacturing industries and (b) other industries in the various districts constituting the region. [346]

The percentages for the region as a whole have been adjusted to make a slight allowance for a greater number of employed persons in the higher age groups in the future, due to the declining birth rate, which will have a marked effect on the numbers of juveniles and young people in employment. These figures in columns 9 and 10 have been obtained by adjusting the percentages set out in

columns 6 and 7, taking into account also the redistribution of the industrial population which will ensue from the redevelopment of congested residential areas. [347]

From the estimated number of employees who will ultimately be engaged in the manufacturing industries and from the representative site areas per 1,000 of the population known to be required in each industry, it has been possible to estimate the net areas required for the manufacturing industries (column 13, Table 14). Areas were then assessed for other industries, mining and quarrying, building, the essential services and the distributive trades (column 14). The resulting total net site requirements for industry are set out in column 15. [348]

Conditions obtaining generally in the region justify the assumption that the area required for a given population engaged in manufacturing industries is approximately double that which would be required for the same population in other industries. [349]

Having estimated the net areas required for all industries by the ultimate population of each local authority, allowances have been made for service roads (12 per cent of net area), for recreational space (one acre per thousand employees engaged in manufacturing industries), for expansion of industry (20 per cent of net area) and for land unfit for development (five per cent of the total area). The resulting total area obtained (column 21, Table 14) may be considered the minimum requirement of all industry in the region. [350]

Since the areas so determined have been based primarily on the present population living rather than working in each district, and since they take no account of the location of existing industry, they are not necessarily the areas which it would be expedient to zone for industry. They do, however, provide a guide for overall industrial zoning which will ensure that there is sufficient space for the amount of industry required to maintain the whole of the estimated future population of the region in employment, and for that industry to be developed at a good standard. They also serve as a guide to conditions which will reduce the problem of travelling to work to a minimum. [351]

Having regard to the location of existing industry, e.g., the concentrations at Trafford Park, Irlam and Gorton (Manchester), including the lands adjoin-

ing industrial undertakings which are unsuitable for development or amenity purposes, an assessment has been made of the actual areas to be zoned for industry (column 23, Table 14), using the calculated areas as a guide. Column 24 shows the industrial acreage per 1,000 persons. The figure in respect of the whole region is 6.1 acres per 1,000. [352]

It will be noted that in column 4 of Table 13, two figures have been given for the manufacture of cotton. The higher figure has been based upon the exclusive use of ring frames in the redevelopment and future development of the industry, involving one-storey development only. It has been estimated that if the industry were to be developed on a ring-spinning basis the number of operatives required to maintain pre-war output would be appreciably reduced. It is not, however, to be assumed that the output of the industry will remain at its pre-war level; in fact the desirability of a larger export trade suggests that output should be increased. [353]

As the population of the region is dispersed by residential redevelopment, it is essential, for the purpose of maintaining balanced conditions of living with full opportunity for work within reasonable distance of home, that industry should likewise be dispersed. Limits to such dispersal will be set by the conditions obtaining in the industries themselves. Obviously, heavy industry tied to transport facilities and to docks, canals, etc., could not generally be dispersed; similarly industry requiring special provisions, such as process water, special means of effluent disposal, etc., could not be dispersed to anything like the same degree as the lighter types of industry. Every effort must be made therefore to encourage the dispersal of those industries which are not tied to their present sites by economic conditions. [354]

### Special industries

The information obtained from the industrial survey and the survey of operatives per acre has revealed also the extent to which special industries are established in the region. These are the industries or trades falling within the scope of the third schedule of the Ministry of Health's Model Clauses. A special industry may fairly be defined as one which cannot be considered a good neighbour when sited in proximity to other forms of development, because it pollutes the air with smoke

Table 14 ASSESSMENT OF INDUSTRIAL AREAS—MANCHESTER REGION

89

(1) <i>Local authority</i>	(2) <i>Population at 1931 census</i>	(3) <i>Total industrial population including unemployed 1931 (productive industry)</i>	(4) <i>Industrial population in manufacturing industries including unemployed</i>	(5) <i>Population in other industries and services 1931</i>	(6) <i>Industrial population in manufacturing industries (col. 4) as percentage of total population</i>	(7) <i>Population in other industries (col. 5) as percentage of total population</i>	(8) <i>Ultimate population at 3-25 persons per house</i>	(9) <i>Ultimate percentage of population in manufacturing industries</i>	(10) <i>Ultimate percentage of population in other industries</i>	(11) <i>(9)+(10)</i>	(12) <i>Ultimate industrial population in productive industries and other industries and services</i>	(13) <i>Net site acreage required by part of ultimate industrial population for manufacturing industries</i>	(14) <i>Additional acreage required by other industries and services</i>
Manchester .. ..	766,378	283,293	182,647	100,646	23.8	13.1	475,000	25.0	13.5	38.5	182,900	1,125	314
Salford .. ..	223,438	84,900	58,710	26,190	26.3	11.7	89,404	26.8	12.0	38.8	34,670	235	53
Eccles .. ..	44,416	15,326	9,655	5,671	21.8	12.8	43,907	24.6	12.4	37.0	16,245	185	47
Middleton .. ..	29,188	13,615	11,115	2,500	38.1	8.6	60,000	32.8	10.3	43.1	25,880	195	31
Prestwich .. ..	23,881	6,380	3,605	2,777	15.1	11.6	32,734	21.3	11.8	33.1	10,825	57	16
Stretford .. ..	56,791	20,389	13,429	6,960	23.6	12.3	51,373	25.5	12.2	37.7	19,370	113	27
Swinton & Pendlebury	32,761	13,418	7,615	5,803	23.2	17.7	41,528	25.3	14.9	40.2	16,690	118	69
Audenshaw .. ..	8,461	3,595	2,800	795	33.0	9.4	13,712	30.2	10.7	40.9	5,615	38	7
Denton .. ..	17,384	8,461	6,966	1,495	40.1	8.6	33,010	33.8	10.3	44.1	14,580	73	11
Droylsden .. ..	13,274	5,875	4,465	1,400	33.7	10.6	22,899	30.6	11.3	41.9	9,595	72	13
Failsworth .. ..	15,726	7,220	5,572	1,648	35.4	10.5	20,312	31.4	11.3	42.7	8,665	59	10
Irlam .. ..	12,901	4,696	3,800	896	29.4	7.0	22,214	28.4	9.5	37.9	8,430	253	10
Urmston .. ..	9,284	3,058	1,827	1,231	19.7	13.3	44,129	23.6	12.7	36.3	16,010	140	38
Worsley .. ..	14,502	5,969	3,011	2,958	20.8	20.4	70,000	24.1	16.2	40.3	28,250	152	102
Region .. ..	1,268,385	476,195	315,215	160,980	24.9	12.7	1,020,222	25.5	13.5	39.0	397,725	2,815	748

Table 14 ASSESSMENT OF INDUSTRIAL AREAS—MANCHESTER REGION (continued)

Local authority		(15) Total net site acreage required by ultimate population	(16) Allowance for roads at 12 per cent of net area	(17) Recreational space at one acre per 1,000 employees in manufacturing industries	(18) Allowance of 20 per cent of net area for industrial expansion	(19) Gross acreage required by ultimate population	(20) Allowance of 5 per cent for land unfit for development	(21) Total acreage required by ultimate population living in each authority	(22) Acreage of existing industry	(23) Total acreage to be zoned for industry having regard to existing siting	(24) Acreage per 1,000 of ultimate population
Manchester	...	1,439	173	118	288	2,018	101	2,119	1,700	2,200	4.6
Salford	...	288	35	24	58	405	20	425	320	429	4.8
Eccles	...	232	28	11	46	317	16	333	232	243	5.5
Middleton	...	226	27	20	45	318	16	334	157	204	3.4
Prestwich	...	73	9	7	15	104	5	109	85	79	2.5
Stretford	...	140	17	13	28	198	10	208	430	665*	12.9
Swinton and Pendlebury	...	187	22	11	37	257	13	270	285	450	10.8
Audenshaw	...	45	5	4	9	63	3	66	52	57	4.2
Denton	...	84	10	11	17	122	6	128	97	125	3.8
Droylsden	...	85	10	7	17	119	6	125	52	59	2.6
Failsworth	...	69	8	6	14	97	5	102	113	88	4.3
Irlam	...	263	32	6	53	354	18	372	275	501	22.6
Urmston	...	178	21	13	36	248	12	260	391†	790	17.9
Worsley	...	254	30	15	51	350	18	368	188	337	4.8
Region	..	3,563	427	266	714	4,970	249	5,219	4,377	6,227	6.1

Note—\* Excluding docks.

† The Davyhulme Sewage Works has been excluded.

or uses certain chemicals or processes giving rise to fumes which are injurious to health, or is otherwise objectionable on the grounds of noise or smell. [355]

Of the manufacturing industries classified in the 1931 Census of Industry, 14 may be regarded as wholly, or in part, of a special character. These industries, together with the number of persons employed in them throughout the region in 1931, are set out below:

<i>Industry</i>	<i>Persons employed</i>
Chemicals and explosives .. .. .. ..	6,331
White lead and paints .. .. .. ..	474
Oils, greases and glues .. .. .. ..	3,730
Iron and steel smelting .. .. .. ..	3,970
Extraction, etc., of other metals .. .. .. ..	405
Iron and steel founding .. .. .. ..	6,012
General engineering (in part) .. .. .. ..	4,148
Other metal industries (in part) .. .. .. ..	5,202
Electrical engineering (in part) .. .. .. ..	6,848
Repair of vehicles (in part) .. .. .. ..	2,242
Currying furs, etc. .. .. .. ..	1,208
Tripe dressing .. .. .. ..	1,465
Rubber .. .. .. ..	6,785
Gas production .. .. .. ..	1,251

[356]

The manufacture of bricks, pottery and glass, which involves processes of a special character, has been omitted since this industry is closely tied to natural resources, and these may rarely corre-

spond geographically with the most advantageous locations for special industry. However, the industry plays only a small part in the industrial composition of the region.

[357]

In making an assessment of the area required for special industry it has been necessary to consider the extent to which some of the aforementioned industries may be considered as special industries. By reference to the more detailed sections of the census tables, which give the number of persons employed in the various sub-divisions of the broadly classified industries, it has been possible to arrive at the following percentages:

<i>Industry</i>	<i>Extent to which industry may be considered as special</i>
General engineering .. ..	20 } expressed
Construction and repair of vehicles .. ..	20 } as a
Electrical engineering .. ..	30 } percent-
Other metal industries .. ..	50 } age

Considering the relative fixity of the heavy industries, and allowing for changes in the ultimate population of the region, it has been estimated that approximately 1,350 acres will need to be reserved for special industry, or approximately 22.8 per cent of the total area requirements of industry.

[359]

BEFORE THE WAR the roads of Great Britain were the most heavily trafficked in the world; there is every reason to believe that they will remain so in the future. In 1919 the number of licensed motor vehicles was about 350,000; by 1938 it had increased to 3,100,000. The post-war growth of traffic is expected to result in the doubling of the 1938 volume in another 25 years or so. [360]

The existing highway system was based on the requirements of horse-drawn traffic, primarily of a local character; yet this pattern has had to cope with the heavy and fast traffic of this highly industrialised age. Fortunately, many of the principal roads linking the region's once separate communities were laid out on such a generous scale that for many years a policy of local widenings and improvements of the worst bottlenecks—when conditions became intolerable—could be made to suffice. The introduction of one-way street systems and unilateral parking has served as a means of postponing the date when the congestion in the business areas, due to the ever-increasing number of vehicles licensed, will produce conditions under which it may become speedier to proceed on foot. The war has only temporarily halted the growth. The problem to be faced in the future is one of wholesale saturation—of traffic flows far exceeding the capacity of the present road system. [361]

Traffic accidents have caused loss of life and injuries on a vast scale. Between 1931 and 1938 the number of persons killed on the roads of Great Britain amounted to 54,247, while 1,759,152 were injured. During this period the figures for Manchester alone were 725 persons killed and 29,297 injured, or about one in every 1,180 of the inhabitants killed, and one in every 29 injured. Until the Road Traffic Act of 1930 re-imposed a speed limit in built-up areas, the increase in casualties was proportionate to the increase in the number of vehicles on the roads. Although this measure checked the rise in accident figures, the number of accidents remains much too high: it will continue so while main traffic streams are

forced to pass through shopping centres and near schools. [362]

The requirements of war have greatly expanded the output of vehicles, and vast numbers of people of both sexes have been trained to drive them. The switch-over of plant to peace-time production will bring an immediate increase in road traffic; the comparative lull—giving a false sense of security to pedestrians—will be over. Congestion, delays and accidents will mount rapidly unless the problem is tackled with vision. The roads cannot, however, be reconstructed overnight: many forms of palliative will have to be improvised and inconvenience endured while long-term reconstruction is taking place. [363]

### THE EXISTING HIGHWAY NETWORK

Table 1 sets out the more important main roads in the region and their functions. [364]

There are, in addition, a number of radial roads of Class I status and also Class II roads of quasi-circumferential character which do not form parts of long-distance or national routes. These have in the main been developed from occasional improvements of existing district roads in an attempt to relieve the growing congestion on older principal routes; or, as in the case of Princess Road and Kingsway (Manchester), have been planned to link up the city centre with large municipal housing estates and ultimately to provide new outlets to the surrounding countryside. [365]

### DEFECTS OF THE EXISTING SYSTEM

Before setting out the objectives of the road proposals it is necessary to consider the deficiencies of our present system. [366]

#### Absence of ring roads

Fig. 19 shows that the principal existing roads converge on the centres of Manchester and Salford. Thus the three trunk roads which enter the region

Table 1 PRINCIPAL ROADS IN THE REGION

Classification number	National and regional routes	Principal sections within the region
	<b>TRUNK ROADS</b> (outside county borough boundaries) Swansea—Chester—Manchester Liverpool—Leeds—Hull	
A.56 A.580 and A.62	London—Derby—Manchester—Preston—Carlisle—Scotland	Chester Road (Stretford) East Lancs. Road (Worsley and Swinton) and Oldham Road (Failsworth) Chorley Road (Swinton) and Manchester Road (Worsley)
	<b>PRINCIPAL CLASS I ROADS</b>	
A.34	Manchester—Wilmslow—Potteries—Birmingham—Winchester	Oxford Road and Wilmslow Road (Manchester)
A.56	Chester—Manchester—Bury—Burnley—Skipton	Chester Road, Deansgate and Gt. Ducie Street (Manchester), Bury New Road (Salford and Prestwich)
A.57	Liverpool—Warrington—Salford—Manchester—Hyde—Sheffield	Liverpool Road (Irlam and Eccles), Eccles New Road, Regent Road (Salford); Whitworth Street and Hyde Road (Manchester) and Manchester Road (Denton)
A.6	London—Manchester—Carlisle	Stockport Road, London Road and Market Street (Manchester); Chapel Street, Broad Street and Bolton Road (Salford)
A.62	Manchester—Oldham—Huddersfield—Leeds	Oldham Street and Oldham Road (Manchester)
A.560	Chester—Altrincham—Stockport—Hyde—Barnsley	Altrincham Road (Wythenshawe)
A.572	Manchester—Leigh—Wigan	Worsley Road (Swinton) and Leigh Road (Worsley)
A.575	Stretford—Worsley—Bolton	Barton Road (Stretford), Redclyffe Road (Urmston), Worsley Road (Eccles), Walkden Road and Bolton Road (Worsley)
A.576	Warrington (Rd. A.57)—Eccles—Salford—Middleton—Rochdale (Rd. A.664)—Halifax	Church Street (Eccles), Eccles Old Road, Cromwell Road, Great Cheetham Street and Lecester Road (Salford), Middleton Road (Manchester) and Manchester Old Road (Middleton)
A.635	Manchester—Stalybridge—Holmfirth—Barnsley	Ashton Old Road (Manchester), Manchester Road (Audenshaw)
A.662	Manchester—Ashton-under-Lyne	Every Street, and Ashton New Road (Manchester), Droylsden Road (Audenshaw)
A.664	Manchester—Rochdale—Halifax—Leeds	Rochdale Road (Manchester and Middleton), Manchester New Road (Middleton)
A.666	Salford—Bolton—Blackburn—Clitheroe—Skipton	Bolton Road (Swinton and Pendlebury)

are continued as main roads through these centres, compelling long-distance traffic to use city streets in the absence of adequate avoiding roads. Thus Market Street (Manchester), Chapel Street and Broad Street (Salford) still form part of the main London-Carlisle-Glasgow Road (A.6) and at the same time are popular and important shopping streets. [367]

Within the region the roads in Table 1 also carry a heavy volume of shuttle traffic between the two cities of Manchester and Salford and the surrounding manufacturing towns of South Lancashire and North-East Cheshire. [368]

The need for the construction of ring roads—to divert long-distance traffic and to link up districts within the region—is obvious. [369]

#### Mixed character of traffic

The rapid growth of Manchester and Salford as manufacturing towns, and the subsequent emergence of Manchester as the marketing centre of the region, led to a heavy traffic of horse-drawn vehicles to and from the ten main goods terminals and between spinning mills, warehouses, and finishing works; this traffic contributes largely to the congestion in the regional centre. [370]

The rapid building-up of the region was soon followed by the development of an extensive tramway system. Routes were established on all the radial roads linking Manchester and Salford with the outlying towns, as well as in most of the principal streets in shopping and industrial areas. For a time the faster tram had to contend alone

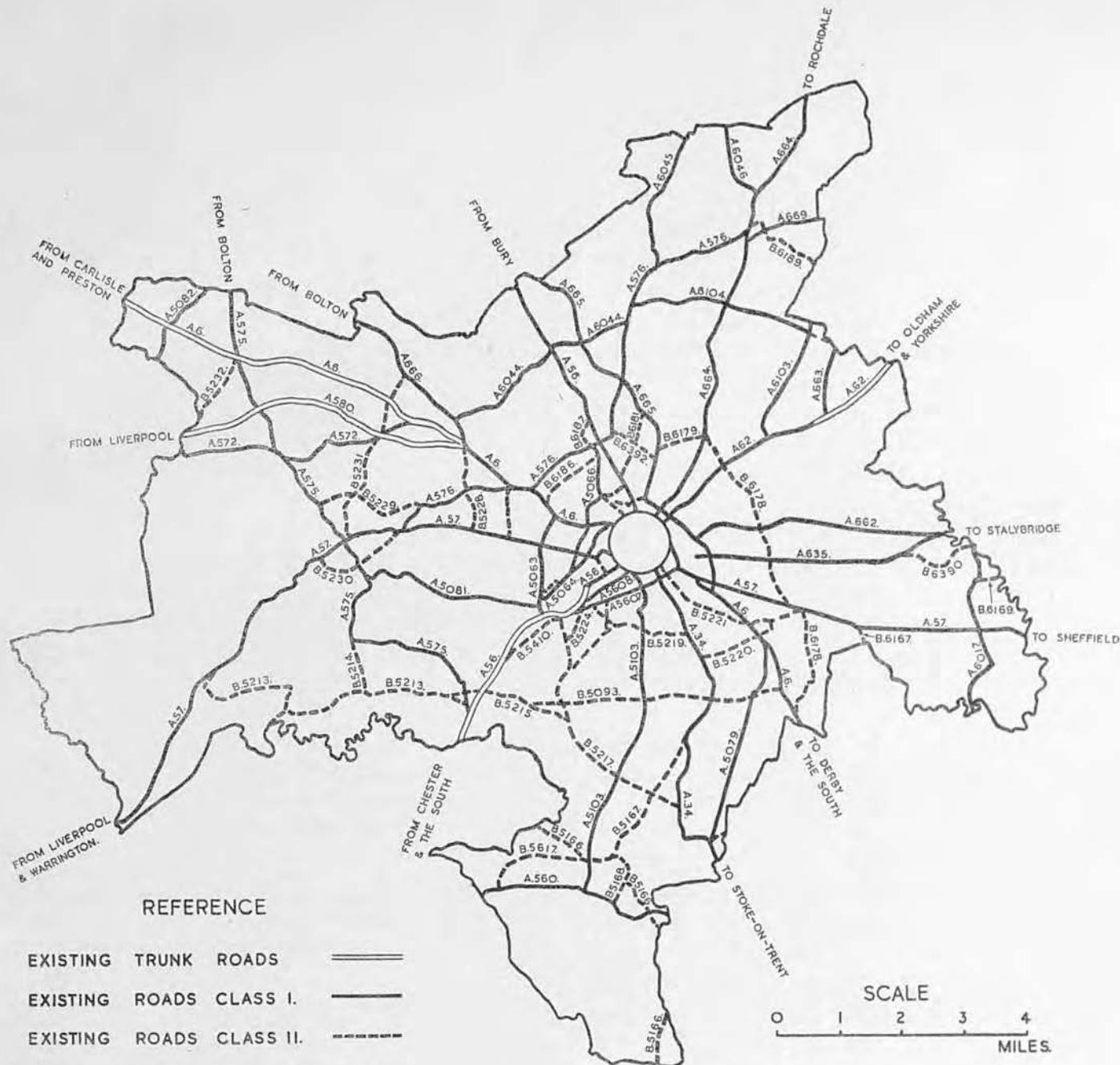


Fig. 19. Existing regional highway network.

with the slow-moving horsed vehicle. The prevalence of the latter was increased by the opening of the Manchester Ship Canal in 1894 and the accelerated development of the import and export trade of the city. [371]

With the appearance of the motor car and motor bus, however, a new conflict between classes of road users was soon in evidence. Horsed vehicles often set the pace for all, or held up main traffic streams at road crossings. Trams, running in the middle of the carriageway, had to set down and take up passengers in front of fast-moving vehicles.

Not only were passengers imperilled, but the bunching up of traffic at each tram stop seriously interfered with general traffic movement. The capacity of the road itself was limited by the occupation of the crown traffic lane by trams, and of the kerb-side lane by slow-moving or stationary vehicles. (Travelling at about four miles per hour, horse-drawn vehicles reduce the capacity of a traffic lane from 1,000 vehicles per hour to about 360.) [372]

The replacement of trams by motor buses and, on some routes, by trolley buses is already well

advanced, and is expected to be completed on the remaining routes shortly after the war. The seriously restrictive effect of horse-drawn vehicles may at an early date require their exclusion from our major roads. [373]

Buses have the great advantage of flexibility of route and of kerb-side loading; but with the outward growth of the built-up area the number of buses required to convey workers to central areas is becoming substantial in proportion to the total number of vehicles on the roads. Thus while the ratio of trams and buses to other traffic in outer districts amounts to approximately five per cent, the density in Portland Street (Manchester) and Market Street respectively reaches 22½ per cent and 13 per cent of all traffic. The future increase in motor vehicles will largely consist of private cars, with a smaller increase in goods vehicles. Ultimately buses will form only some 10 per cent of the total traffic in central areas. [374]

The average speeds (including stopping times to pick up or set down passengers) of trams, buses and trolley buses are shown in the following Table. [375]

the import and export trades of South Lancashire, are also the docks nearest to Birmingham and the Midlands. In consequence long-distance road transport has to mingle, in the absence of direct dock approaches and ring roads, with the ordinary vehicles and private cars bound to and from the centres of Manchester and Salford. [377]

Although the cycle does not form an important factor in regional road traffic, yet in the densely built-up intermediate areas it is widely used for short-distance daily travel to and from work. In these areas many of the bus services at peak hour run non-stop with full loads between the central bus stations and the outer dormitory suburbs. The presence in the same carriageway of cyclists, horse-drawn vehicles, buses and commercial and private vehicles restricts the average speed of all classes and adds to danger and delay. The suburban and long-distance traffic has little interest in the local communities occupying these intermediate areas; radial routes should be adapted to accommodate this traffic without detriment to these areas. [378]

Table 2 AVERAGE SPEEDS OF TRAMS, BUSES AND TROLLEY BUSES

Locality	Trams		Buses		Trolley buses	
	Average speed including all stopping times (miles per hour)	Average speed between stops (miles per hour)	Average speed including all stopping times (miles per hour)	Average speed between stops (miles per hour)	Average speed including all stopping times (miles per hour)	Average speed between stops (miles per hour)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Central city area .. ..	6.9	8.8	10.7	12.8	10.0	11.3
Dense development .. ..	10.3	11.7	13.9	15.7	12.8	15.3
Open development (e.g., housing estates) .. .. ..	11.5	13.3	14.5	16.0	14.0	17.6

As the capacity of any traffic lane in a road in full use is largely governed by the speed of the slowest vehicle in it, the average speed of passenger service vehicles has an influence on total capacity. On the other hand, a public passenger vehicle is much more economical in the use of street space per traveller than is a private car. [376]

In the intermediate areas that lie between half a mile and two miles from the regional centre, road traffic includes a high percentage of commercial vehicles serving the main industrial belts contained in this area. Combined with this traffic is that to and from the docks. These, in addition to serving

#### Inadequate car-parking facilities

The loss of traffic-carrying capacity is also largely aggravated by lack of parking space. Although some car parks exist, they are neither sufficiently numerous nor conveniently distributed. Unless they are within easy walking distance of the motorist's destination street parking must be expected. Whenever this occurs the traffic which would normally have used the traffic lane next to the kerb is forced out towards the crown of the road, resulting in the total elimination of one line of traffic from the carriageway. Congestion and risk of injury to pedestrians and drivers alike arise from the

obstruction of vision caused by standing vehicles. Even intermittent parking is sufficient to cause the loss of at least half the capacity of the centre lane of the road—the one accommodating the faster vehicles. The combined effect of kerb-side parking and horse-drawn traffic is to reduce the capacity of (for example) a four-lane road from some 2,800 vehicles per hour to about 720, or of a six-lane road from 5,000 to 2,800 vehicles per hour. Clearly, this use of street space is obtained at a prohibitive cost. [379]

Clearance sites arising from war damage or during redevelopment could provide temporary parking facilities until reconstruction commences. During the years which will elapse while traffic is growing and road improvements are taking place, extemporised car parks will be very necessary, particularly on the fringes of the central area, if peak-hour traffic is to be kept moving through the present street system. Ultimately, redevelopment of the commercial centre to modern standards with taller buildings should lead to the creation of private parking space within each building block. Commercial loading accommodation and parking space for places of public assembly can be required for new buildings under powers contained in Section 19 of the Town and Country Planning Act, 1932, and in Section 17 of the Restriction of Ribbon Development Act, 1935; a permanent solution to the kerb-side parking problem may necessitate the provision of car-parking space in connection with all new commercial buildings. [380]

#### **Shopping, business and factory frontages on main roads**

The congestion and restricted movement of traffic in central and suburban business and shopping areas is largely due to the building-up of main-road frontages with direct access from these traffic routes. This practice of using the main road as a service road can be tolerated only up to the stage when growth of traffic exceeds the carrying capacity of the carriageway as depleted by stationary vehicles. With the introduction of mechanically-propelled vehicles, with speeds and interests widely differing from those of the shopper or business caller, the conflicting functions of traffic routes through shopping areas created dangerous conditions for pedestrian and driver alike. To-day the majority of accidents in built-up

areas occur in such circumstances. (Many are also caused by traffic attempting tortuous routes through local streets in an attempt to avoid congested main roads.) [381]

The greatly increased traffic flows of the future will necessitate the treatment of the main roads primarily as traffic arteries for the safe and free movement of motor vehicles. Such roads will carry from four to six lines of vehicles at peak hours, so that pedestrians will have to cross by subways. Clearly such roads must not have shopping frontages. Where shops are already there, the road must either be diverted when traffic growth necessitates, or the shops collected into nearby shopping centres when their rebuilding is undertaken. [382]

Long-term reconstruction to modern standards must ensure that service access to premises adjoining traffic routes is no longer obtained at the expense of the carrying capacity of the main road. [383]

#### **Restrictive effect of junctions and intersections**

Unless road junctions are properly designed they reduce traffic flow to an extent which severely limits the capacity of the roads leading to them. Many junctions will have to be improved in advance of the general road programme to accommodate the earlier stages of post-war traffic growth: no major junction in the region to-day is adequate to deal with the flows which it will ultimately be required to accommodate. Frequent side-street entrances have an effect on capacity at least as serious as that of car parking; traffic turning into and from them obstructs the smooth flow of main-road traffic in all its lanes. [384]

#### **Repairs to public services**

The present main roads are used as routes for the principal public utility services, e.g., sewers, water and gas mains, and electricity and telephone cables. Many of these are under the carriageways, so that when repairs or service connections have to be made the capacity of the carriageway is temporarily but nevertheless seriously reduced, often to a single traffic-lane. Not only does congestion and delay occur, but a common cause of accidents is established. [385]

Where these services follow main traffic routes they should be duplicated and laid under the footpaths and side verges. Generally the widths

necessary to accommodate the future increased traffic flows will render the duplication of service mains on each side of the road an economic necessity. [386]

#### Other defects

Major roads must necessarily be of considerable width, and they need decorative treatment to offset the monotony which otherwise results from wide expanses of paving. Most of the existing main roads are flanked by continuous lines of small houses, warehouses or industrial buildings. Many premises are used as advertising stations, and the general effect of the typical street scene is one of dreariness punctuated with blatant posters by day and distracting neon signs by night. Princess Parkway illustrates how a major traffic route can be transformed by the introduction of colour and spaciousness in its plantations and lawns. [387]

### ACCESS TO THE DOCKS AND TRAFFORD PARK INDUSTRIAL ESTATE

Mention is made in Chapters VI and VIII of the importance in the regional economy of the docks and the adjoining industrial estates. Efficiency of transport by road and rail is of paramount importance to their continued prosperity. This question has been prominent in the discussions of the local planning authorities ever since their inauguration; but improvement of road access to the docks and Trafford Park is made difficult by two main physical features. First, the Ship Canal and its continuation as the River Irwell cuts the dock area—and the region—in two, so that access from either bank is limited to the swing bridges at Barton and Trafford Road, or the bridges linking the central areas of Manchester and Salford. Secondly, the absence of adequate avoiding roads forces most of the dock traffic to use main roads through central and local shopping areas, adding materially to traffic delays and hence to the cost of commodities. [388]

The physical barrier represented by the Ship Canal has a severely restricting effect on the development of regional road communications. The interruption of traffic over the swing bridges has for many years been the subject of trenchant criticisms. There have been many conferences between the interested local authorities and the

county councils, and proposals for new road bridges or, alternatively, a road tunnel, have been investigated from time to time. The problem has always been to provide improved access to the docks and to Trafford Park from all directions without interfering with the efficient manoeuvring of shipping. [389]

Barton Swing Bridge is the first all-purpose bridge upstream from Warrington, and in addition to local traffic carries through traffic between the Midlands and Bolton and North Lancashire. Discussions with the Ministry of Transport and the county councils led to the inclusion in the pre-war proposals of a high-level bridge as part of a westerly by-pass of Manchester and Salford, sited west of the swing bridge, and passing near to Trafford Park and Barton Dock estates. It is incorporated as part of the Outer Ring Road referred to later. [390]

Important as the new Barton Bridge will be, relief is also required at Trafford Road for cross-river traffic and access to the docks and the eastern end of Trafford Park. Either a fixed high-level bridge, with a deck some 78 feet above water level, or a road tunnel should be provided. The former is proposed, as the cost for twin tunnels, each 27 feet in diameter, has been estimated at well over £2,000,000, or three times the estimate for the high-level bridge. The road proposals as now planned to meet future requirements will bring a vast increase in traffic to these two bridges. While the pre-war traffic hold-ups—annoying as they were—might be regarded as hardly warranting the construction of new bridges both at Barton and at Trafford Road, the need in the future will become imperative. [391]

The Manchester and Salford Docks have seven road entrances on the north bank of the canal and six on the south side. Of the latter, three are inside Trafford Park itself. Table 3, based upon a ten days' traffic census in 1943, shows the general movements and relative intensity of road traffic to and from the docks. [392]

The traffic using the seven dock entrances in Salford was 43.01 per cent of the whole; traffic using the three gates off Chester Road (Manchester and Stretford) amounted to 25.13 per cent; the three gates in Trafford Park served for the remaining 31.86 per cent. [393]

Excluding traffic to and from local destinations

Table 3

ROAD TONNAGE (EXCLUSIVE OF VEHICLES)  
ENTERING AND LEAVING THE DOCKS  
(10-day period, March, 1943)

Destination	Inward net tonnage	Outward net tonnage	Total tonnage	Percentage of whole
Manchester ..	2,158	8,868	11,026	37.47
Salford ..	566	1,524	2,090	7.10
Trafford Park ..	452	1,017	1,469	4.99
North of Region ..	830	5,985	6,815	23.16
East of Region ..	379	1,383	1,762	5.99
South of Region ..	745	2,478	3,223	10.95
West of Region ..	1,006	2,038	3,044	10.34
	6,136 (20.85 per cent)	23,293 (79.15 per cent)	29,429	100.00

## Vehicles

Average number entering and leaving per day ..	593
Average weight of load inwards ..	1.03 tons
Average weight of load outwards ..	3.90 tons
Highest number recorded in any one day ..	771
Lowest number recorded in any one day (Sunday) .. .. .. ..	41

in Manchester, Salford and Trafford Park, the principal routes used by the remainder (about one-half) are as follows:

		Percentage
(a) Salford gates:		
via Bolton Road to Bolton, Chorley, Wigan, etc.	28	
„ Oldham Road to Oldham and Yorkshire ..	21	
„ Stockport to Derby and North Midlands ..	12	
„ Middleton Road to Rochdale and West Yorkshire ..	11	
„ Altrincham to Chester and Midlands ..	10	
(b) Chester Road gates:		
via Bolton Road to Bolton, etc., as above ..	20	
„ Stockport, etc. .. .. ..	18	
„ Oldham Road .. .. ..	16	
„ Middleton Road .. .. ..	13	
„ Ashton Old Road to Ashton-under-Lyne, Stalybridge, etc. .. .. ..	11	
„ Altrincham .. .. ..	10	
(c) Trafford Park gates:		
via Barton Bridge to Bolton, Chorley, Wigan, etc.	28	
„ Altrincham .. .. ..	16	
„ Trafford Road bridge and Bolton Road to Bolton, Chorley, Wigan, etc. .. ..	14	

The maximum movement of dock traffic out of the region appears to be via Bolton Road to Irlams-o'-th'-Height, where the Liverpool-East Lancashire Road (A.580), the Manchester-Preston-Carlisle

Road (A.6) and Bolton Road (A.666) converge. Together these carry 22.5 per cent of all dock traffic not destined for places in Manchester, Salford or Trafford Park. Oldham Road, carrying 18.3 per cent to the regional boundary, Chester Road with 11.7 per cent, and routes to Stockport with 11 per cent also carry major shares of this traffic. Barton Bridge, carrying about eight per cent of the total, contributes traffic, via Worsley, additional to that which travels by way of Irlams-o'-th'-Height, to Bolton, Chorley, Wigan, etc. [395]

The proposed Intermediate Ring Road (see Plate 20, facing page 87) will greatly facilitate the circulation of this dock traffic around and clear of the central areas of Manchester and Salford. [396]

## TRAFFIC RESEARCH

Before proposals for the highway system could be developed a quantitative examination of the pre-war traffic flows on the main roads was undertaken, and estimates of ultimate increases were prepared so that all new roads and widenings might be directly related to the volume of traffic to be accommodated on them. [397]

The 1938 traffic census figures throughout the region and adjacent areas were supplemented by a detailed census of 1941 peak-hour flows within the Manchester area which, having points in common with the 1938 census, enabled fair approximations of the corresponding figures for pre-war traffic throughout the city to be made. Upon this information an estimate of the peak-hour traffic for the Manchester area was built up, the major flow in one direction being subsequently used for design purposes. The resulting picture of traffic movements and intensities is illustrated on Plate 17, between pages 78 and 79, where the width of the coloured band is proportional to the number of vehicles in one direction at any point. This plate clearly shows how heavy traffic flows were obliged to pass through the central core of the region. The value of such partial ring roads as existed (e.g., Road A.575 through Worsley to Barton Bridge, Stretford and Sale; also the Queen's Road-Pottery Lane loop on the north-east side of the central area) is apparent. [398]

## Future traffic flows

In arriving at an estimate of the future growth

of traffic, the following factors were taken into account:

(a) The rate at which the number of licensed vehicles was increasing before 1939.

(b) The past trends and developments in motor vehicle usage in the United States (with the highest number of motor vehicles for any one nation). [399]

Before the war there were in the United States some 29,500,000 motor vehicles (excluding motor cycles), or one to every 4.4 persons. It is expected that this ratio will ultimately become at least one to every 3.75 persons. Great Britain had only 2,623,000 motor vehicles (excluding motor cycles) in 1938, or one to every 17.7 persons. Several factors will operate to preclude the attainment here of an ultimate ratio comparable with that of the United States. The American level of family income may reasonably be expected to be higher than ours; the cost of motoring here is at least  $1\frac{1}{2}$  times that in the U.S.A., even taking into account the much smaller engine capacities of our cars. The number of vehicles per mile of road in this country is  $1\frac{1}{2}$  times as high as in the United States; while further extensive road developments can be expected there, this country is more intensely served by its several forms of public transport, and is not so dependent upon the use of private cars. [400]

These factors considered in detail suggest that the saturation point of motor traffic will be reached in this country at a total of some six million vehicles, or one to every 7.5 persons. The comparative British and American figures as they were in 1938 and as forecast for 1970 are shown in Table 4. [401]

After 1970 this country's population will begin to decline, and may be substantially less than 40 millions by the year 1990. At that figure

6,100,000 motor vehicles would be equivalent to one to every 6.56 persons. [402]

The effect of population changes upon the usage of cars is uncertain. At certain income levels a man with a family cannot afford a car: conversely, the cost of running a car may preclude a family. Variations in the birth rate may thus affect the use of cars. Loss of population by dispersal from the cities is not likely materially to reduce the number of vehicles in use: in fact, if motoring costs fall there may be an acceleration both in the rate of dispersal and in the rise in car usage, with more city workers living still further from their work and using their own means of daily transport. [403]

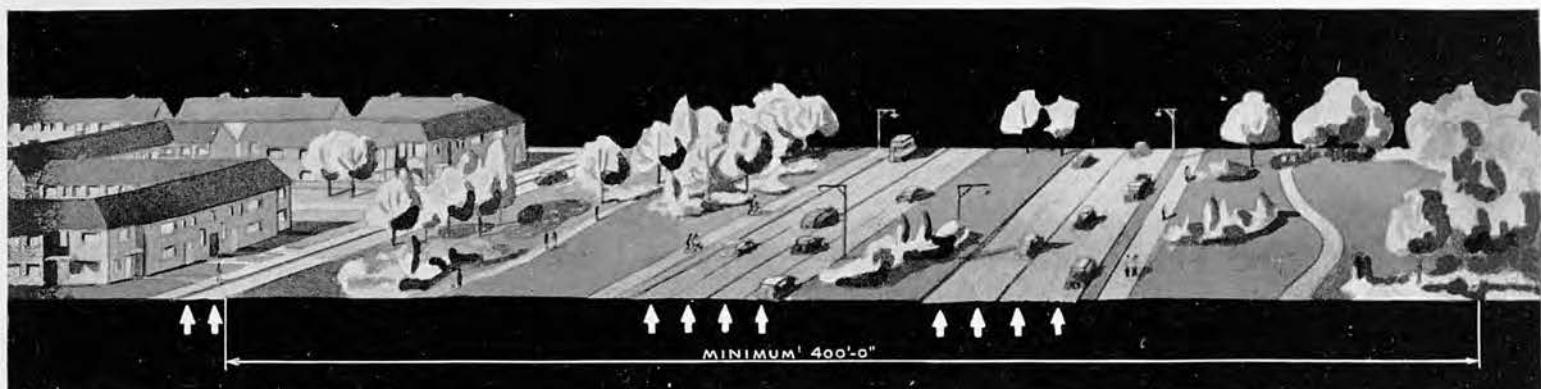
From all these considerations it is suggested that motor traffic in the region will increase to roughly twice its pre-war volume, and the highway proposals have been developed on this basis. The probable effect of dispersal of population from congested districts and of future national highways in diverting long-distance traffic has been taken into account. [404]

Starting from an examination of traffic movements outside the regional boundary, the inward flows towards the centre were progressively determined. It was soon evident that unless ring roads were provided, the volume of traffic which would pass through the central area would require carriage-ways of great width and also junctions on a gigantic scale at the many intersections. The method of working in from the outer districts enabled an estimate to be made of the future peak-hour traffic likely to use the ring roads and the successive sections of radial roads towards the centre. [405]

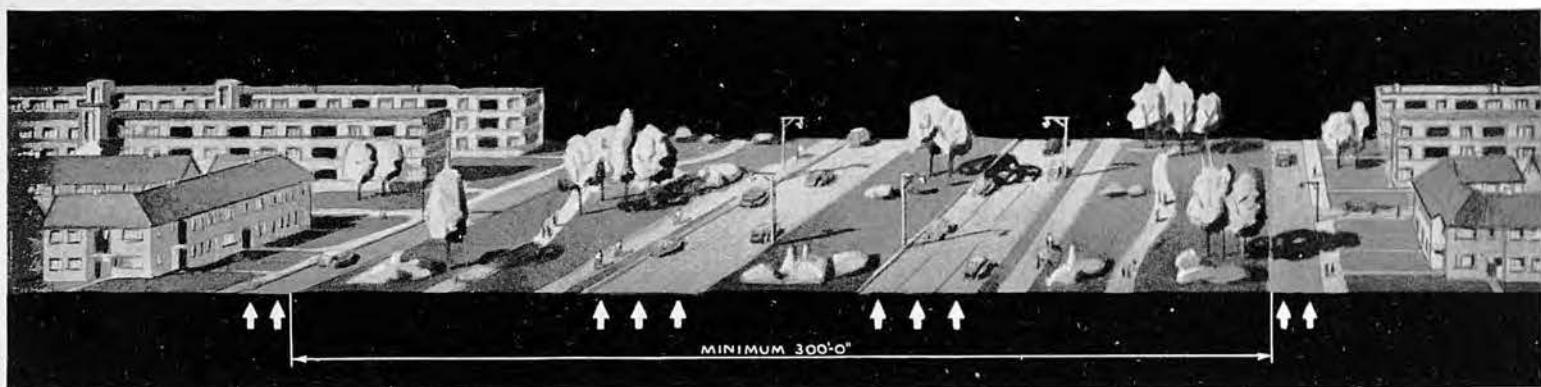
The resulting distribution of traffic densities is illustrated on Plate 18, between pages 78 and 79. If this is examined in conjunction with Plate 17, relating to pre-war traffic, the position and effect of ring roads and by-passes can be seen: without these the

Table 4 ESTIMATED INCREASE IN USE OF MOTOR VEHICLES

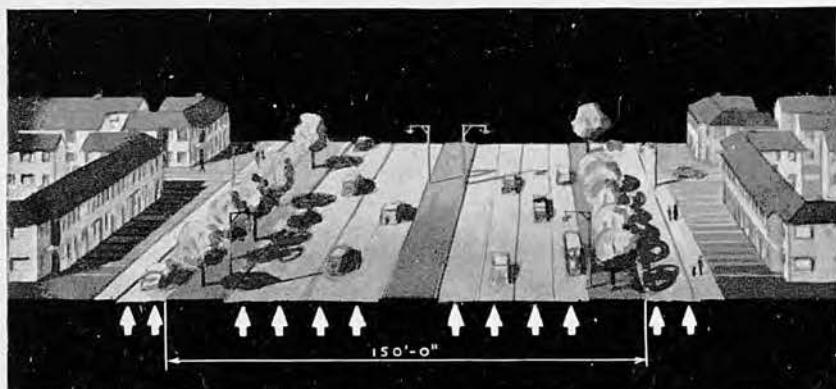
	Estimated 1938 road mileage	1938			1970		
		Number of licensed vehicles (excluding motor cycles)	Licensed vehicles per mile of road	Persons per motor vehicle	Estimated number of licensed vehicles (excluding motor cycles)	Licensed vehicles per mile of road (1938 mileage)	Persons per motor vehicle
Great Britain	178,900	2,623,000	14.66	17.7	6,100,000	34.10	7.5
U.S.A. . .	3,000,000	29,500,000	9.83	4.4	42,000,000	14.0	3.75



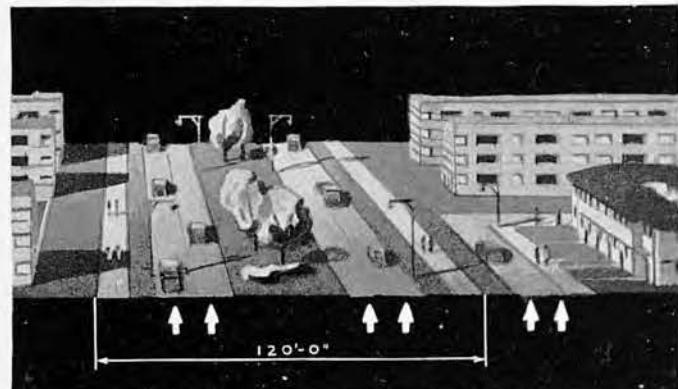
PARKWAY



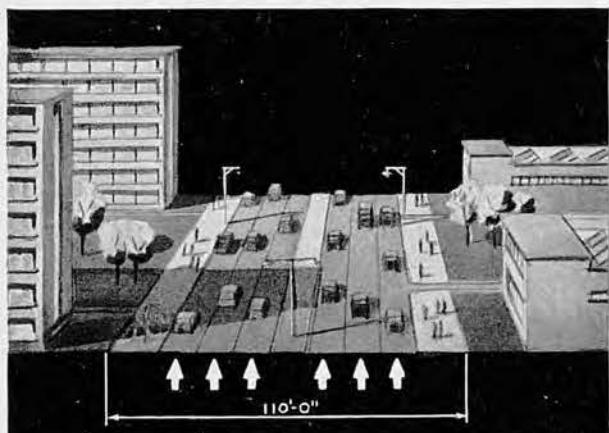
MINOR PARKWAY



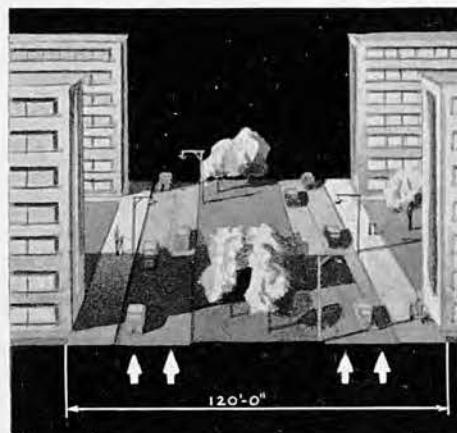
MAJOR ROAD, URBAN AREA



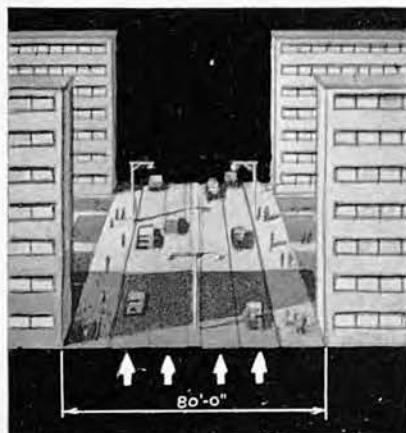
MAJOR ROAD, URBAN AREA



MAJOR ROAD, COMMERCIAL AREA



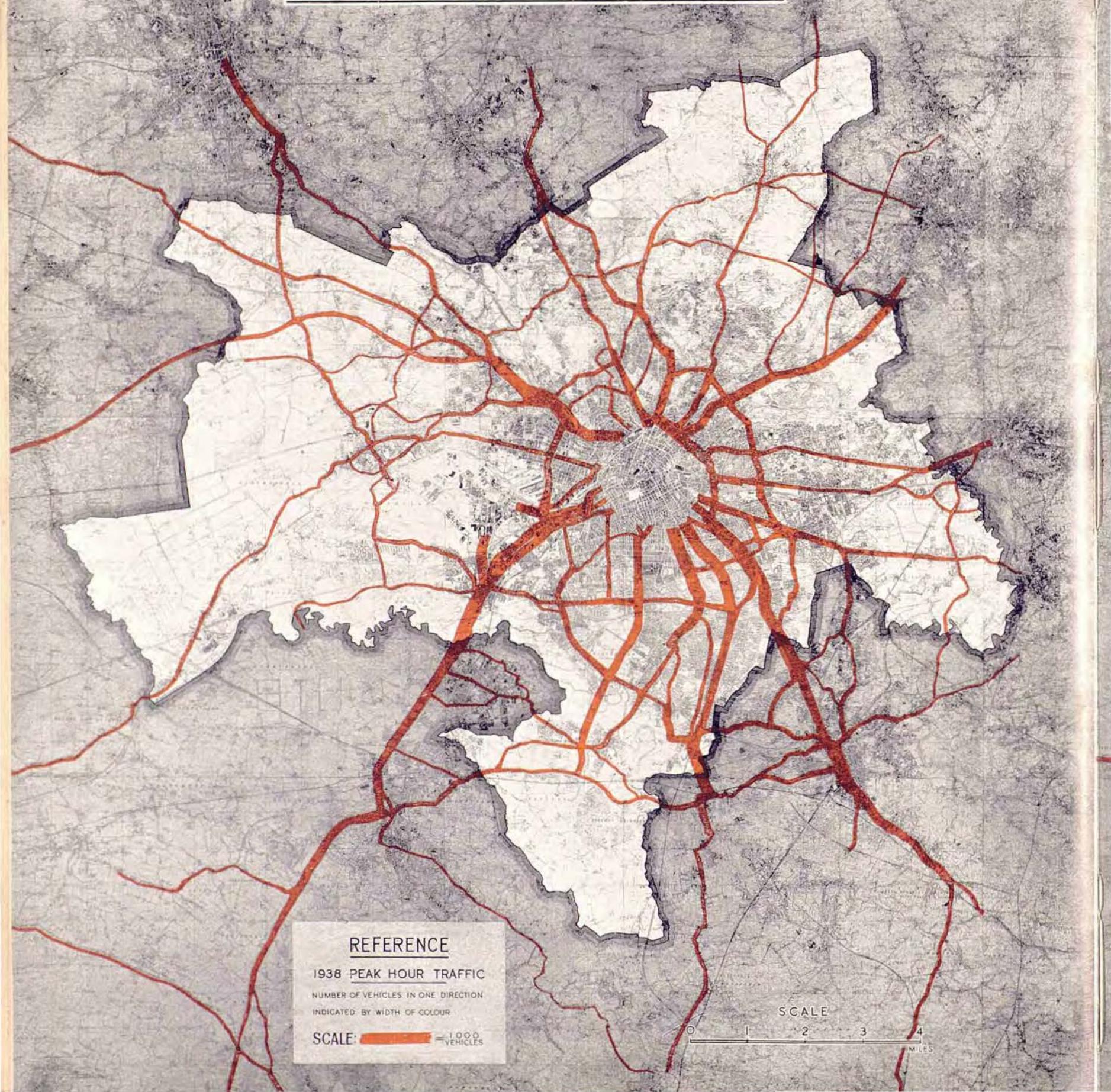
CITY CIRCLE



COMMERCIAL AREA

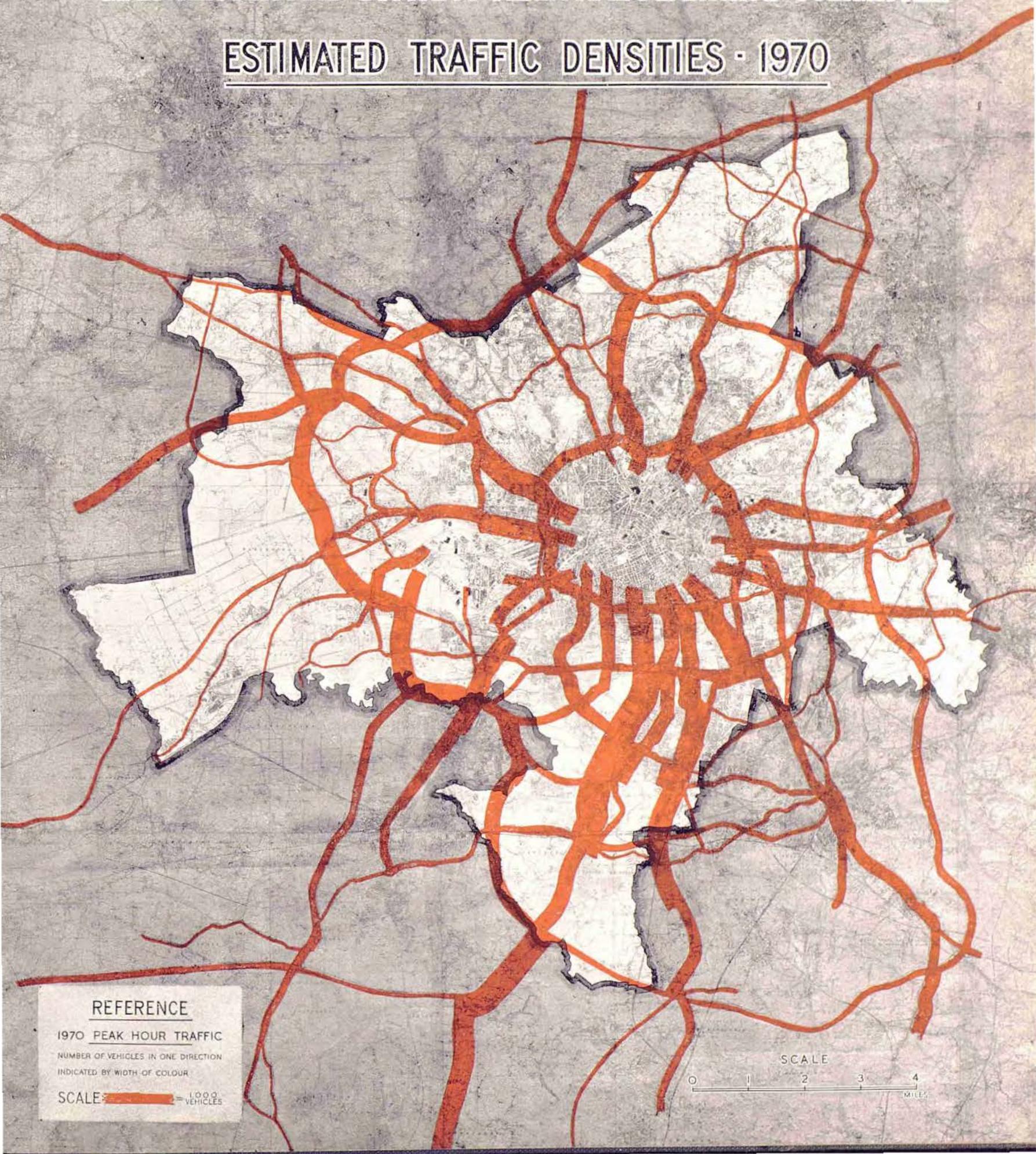
# MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

## EXISTING TRAFFIC DENSITIES



# MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

## ESTIMATED TRAFFIC DENSITIES - 1970



### REFERENCE

1970 PEAK HOUR TRAFFIC

NUMBER OF VEHICLES IN ONE DIRECTION  
INDICATED BY WIDTH OF COLOUR

SCALE 1:100,000 = 1000 VEHICLES

### SCALE

0 1 2 3 4  
MILES



## MODERN HIGHWAY DESIGN

How the problem has been tackled abroad, in the country, in the suburbs and in the town, with wide parkways, safe controlled junctions and provision for fast through traffic.



future traffic volume on the existing road lines would have appeared as bands of colour double the width shown in Plate 17. Whereas in general a two-fold increase of traffic applies to the outer edge of the region, the corresponding increase in the regional centre is estimated to average only about 1·2 times the pre-war densities. Without ring roads and by-passes round shopping centres the choice would fall between sacrificing the entire regional centre to accommodate traffic flows and a complete standstill of traffic through over-saturation of roads in the central area. Either would be disastrous to the future of the region. [406]

### Capacities of carriageways and junctions

Having determined the probable peak load on each section of main road and at each major junction, it was necessary to determine the carrying capacity of a traffic lane and of combinations of traffic lanes and also of various types of road junction. Unfortunately the assessment of traffic-lane capacities has received less consideration than have other aspects of highway design. Research had, therefore, to be undertaken, the results of which are summarised in the following Tables. [407]

Table 5 is based on observations of continuous streams of motor vehicles, without the large breaks which would occur where a road's capacity is considerably in excess of the traffic using it, but with vehicles bunched and separated in places as must always occur in practice because drivers differ in temperament and ideas of safe driving distances and speeds; interruptions may also be caused by stray dogs or speed variations while a cigarette is being lighted, and so on. A bumper-to-

bumper count is obviously of no practical value. The Table indicates that the maximum capacity of a traffic lane is realised when motor vehicles are travelling at about 23 miles per hour. It will be noted that as the speed increases above that figure there is a more than proportionate increase in the headway or space between succeeding vehicles. [408]

Table 6 indicates the effective capacity of a traffic lane where the speed of movement is controlled by the slowest vehicle. [409]

A "pulsing" factor of at least ten per cent must be deducted from these capacity figures to allow for breaks in the continuity of the traffic stream caused by crossing pedestrians, the entry of vehicles from side roads and other interruptions. The working capacities of two- and three-lane undivided carriageways (with two-way flow) must be further reduced to give the faster vehicles reasonable opportunities for overtaking. In built-up areas these capacities should be taken as 1,200 and 1,800 vehicles an hour respectively, with 600 and 1,200 respectively as the maximum capacity in the direction of greater flow. [410]

The full capacity of a road will not, of course, be attained unless all its intersections can cope with the peak traffic flow. The only type of junction which imposes no check on the free flow of either through or turning traffic is the "clover-leaf". However, this takes up so much space (some 31 acres) that its use is economically impracticable in built-up areas. Fig. 20 (page 83) shows a modified form, termed a flyover junction, which requires only about eight acres of land. It is recommended as suitable for use at certain of the most heavily-used intersections in the region. [411]

Table 5 CAPACITY OF A TRAFFIC LANE (VARIOUS SPEEDS)

Type of vehicle	11 miles per hour		14 miles per hour		17 miles per hour		20 miles per hour		23 miles per hour		26 miles per hour		29 miles per hour	
	Number per hour	Head-way or spacing (feet)	Number per hour	Head-way or spacing (feet)	Number per hour	Head-way or spacing (feet)	Number per hour	Head-way or spacing (feet)	Number per hour	Head-way or spacing (feet)	Number per hour	Head-way or spacing (feet)	Number per hour	Head-way or spacing (feet)
Light cars ..	(7)867	67	(9)1,014	73	(7)1,125	80	(18)1,200	88	(16)1,242	98	(25)1,233	111	(10)1,200	127·5
Mixed motor vehicles ..	(13)847	68·5	(62)981	75	(35)1,091	82	(25)1,165	91	(32)1,190	102	(26)1,173	117	(21)1,143	134
Heavy motor vehicles ..	(3)828	70	(5)960	77	(10)1,060	85	(6)1,125	94	(2)1,136	107	—	—	—	—

Figures in brackets denote numbers of traffic streams observed.

Table 6 EFFECTIVE TRAFFIC-LANE CAPACITY (LIMITED BY SLOW-MOVING VEHICLES)

Slowest type of traffic using lane	Average speed (miles per hour)	Number of vehicles per hour							
		Light cars	Mixed motor vehicles	Heavy motor vehicles	Motor buses	Trolley buses	Trams	Cycles two abreast	Horse drawn vehicles
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Continuous parking	—	—	* Capacity of crown lane—Nil			—	—	—	—
Horse-drawn vehicles	4	410	400	390	390	390	240	1,000	345
Pedal cycles	..	11	867	847	828	828	430	2,660	—
Trams									
City area .. ..	9	755	736	720	720	720	400	2,160	—
Dense development	11	867	847	828	828	828	430	2,660	—
Light development	13	960	940	920	920	920	460	—	—
Trolley buses									
City area .. ..	11	867	847	828	828	828	—	2,660	—
Dense development	15	1,030	1,020	1,000	1,000	1,000	—	—	—
Light development	17	1,125	1,091	1,060	1,060	1,060	—	—	—
Motor buses									
City area .. ..	13	960	940	920	920	—	—	—	—
Dense development	15	1,030	1,020	1,000	1,000	1,000	—	—	—
Light development	16	1,090	1,060	1,030	1,030	1,030	—	—	—
Heavy motor vehicles	..	20	1,200	1,165	1,125	—	—	—	—
Mixed motor vehicles	..	20	1,200	1,165	—	—	—	—	—
Light cars	..	23	1,242	—	—	—	—	—	—

\* The effect of parking on a kerb lane is to close that lane. Traffic normally occupying the lane must then use the next lane, and so on, so that it is the capacity of the central lane which is consequently lost.

Table 7 summarises the broad results of many observations taken at signal-controlled intersections. The known factors governing the capacity of such intersections are:

- (i) the actual time a lane is open to traffic—as governed by the signal cycle,
- (ii) the type of traffic using the crossing,
- (iii) the proportion of traffic turning right or left.

[412]

The performance under working conditions is so much affected by other factors of a variable nature that the attempt to find a mathematical basis of calculation has been abandoned in favour of empirical methods. These variables include:

- (a) the behaviour of pedestrians,
- (b) the position taken up by vehicles before turning,
- (c) the braking efficiency and accelerating power of the vehicles.

[413]

Table 7  
SIGNAL-CONTROLLED INTERSECTIONS

Average percentage of vehicles turning right from opposing directions	Average flow in mixed vehicles for traffic lane during a 30-second green period
0	10.0
10	9.2
20	8.4
30	7.6

With green periods of 30 seconds in both directions and the standard amber period of three seconds, each direction will be open for  $\frac{30}{60}$  of an hour in each hour, or 54.54 periods of 30 seconds. From Table 7 it follows that with no right-turning traffic, a lane may be expected to discharge 545 mixed vehicles per hour. Further adjustments are necessary to allow for the effect of left-turning traffic coming from the opposite direction, giving

a slight increase in capacity. Losses produced by heavy pedestrian traffic and by slow-moving vehicles, such as the horse-drawn lorry (which takes twice as long as the average motor vehicle to clear a crossing), must also be considered. [414]

Roundabouts of adequate dimensions are still rare in this country, although they were coming into more general use just before the war. Their capacity is governed by the space provided for the weaving of lines of traffic in the "throat" or length of carriageway between the entrance to and next exit from the roundabout. Tests have been carried out to determine the "weaving lengths" (the length of throat which traffic requires during the sideways movement it must make when it wants to cease following the roundabout and enter one of the roads leading therefrom) and also the capacities of roundabouts with throats varying in width. The following figures have consequently been adopted for design purposes:

Table 8  
DESIGN OF ROUNDABOUTS

Number of traffic lanes in throat	Weaving length required in feet	Capacity of throat in mixed vehicles per hour
2	160	1,778
3	220	2,332
4	260	2,836

[415]

Fig. 20 (page 83) illustrates a roundabout design where the volume and nature of the peak-hour traffic compels the separation of vehicles, cycles and pedestrians at different levels. [416]

With through traffic only, the roundabout has very little advantage over the signalled intersection, but its efficiency increases with the amount of turning traffic. Table 9 illustrates the relative efficiency of the two types where equal quantities of traffic approach the intersection from four directions. [417]

Clearly, the proportion of right-turning traffic affects the choice of junction design. Thus, if 20 per cent of the traffic on a two-lane approach road turns right at a signalled intersection, the capacity of the junction—and therefore of the whole road itself—falls from 1,090 to 742 mixed vehicles per hour, or by 32 per cent; at a three-lane roundabout the drop would only be from 1,166 to 1,060, or

9 per cent. At a flyover junction it would be from 1,810 to 1,610, or 11 per cent. In each case it is assumed that the volume of traffic on the cross road is the same as that on the approach road. An increase in the ratio of cross traffic results in a further marked decrease in the capacity of the approach road, except in the case of the flyover. This is strikingly illustrated in Table 10, which also shows the effect of increasing the number of traffic lanes. It summarises the main findings of the research work into approach-road and junction capacities. From it can be selected the type of junction which will most economically and conveniently accommodate any given peak-hour traffic movement. The capacities are for major highways on which all vehicles (apart from trams and buses halting at regular stops) are obliged to keep moving. Any junction referred to below the horizontal lines in Table 10 will be adequate to deal with the amount of traffic set out in the last column.

[418]

Table 9  
COMPARATIVE CAPACITIES OF SIGNALLED INTERSECTIONS AND ROUNDABOUTS

Traffic conditions	Capacity of each approach (mixed vehicles per hour)	
	Signalled intersections two-lane approach	Roundabout with three-lane throat
Through traffic only ..	1,090	1,166
10 per cent turning right ..	916	1,111
20 per cent turning right ..	742	1,060
30 per cent turning right ..	589	1,014
20 per cent turning left ..	1,090	1,296
20 per cent turning right and 20 per cent turning left .. .. ..	786	1,166

#### Carriageway widths

Where buses and other heavy vehicles are driven abreast a traffic-lane width of 12 feet is desirable for safe and comfortable driving. Although three such large vehicles are not likely to be driven abreast on a three-lane carriageway, no reduction should be made in traffic-lane width since vehicles need greater side-play when three lanes are in use. On curves of limited radius the width of each traffic lane must be increased. The maximum width of transport vehicles is restricted by law to

Table 10 CAPACITIES OF INTERSECTIONS OF VARIOUS TYPES  
(Type of Development : Light Outer Residential Areas)

Type of intersection	Number of lanes*	Per centage of right turning traffic	Ratio of traffic densities (max. flow stronger road + max. flow weaker road)							Number of traffic lanes each way	Type of public service vehicle	Conditions on approach road		
			1/1	3/2	2/1	5/2	3/1	7/2	4/1			Peak-hour	Number of public vehicles per hr.	
Capacity from stronger approach (mixed vehicles per hour)														
Signalled intersection	2	40	425	510	567	607	637	661	680	2	Tram	100	889	
Signalled intersection	2	30	589	707	785	841	888	916	942					
Roundabout	2	40	740	889	988	1,059	1,111	1,153	1,185					
Signalled intersection	2	20	742	890	989	1,060	1,113	1,154	1,187					
Roundabout	..	2	30	773	927	1,031	1,104	1,159	1,202	1,237	2	Bustrolleybus	100	1,273
Roundabout	..	2	20	808	969	1,077	1,154	1,212	1,257	1,293	2	Tram	50	1,291
Roundabout	..	2	10	847	1,016	1,129	1,210	1,270	1,317	1,355 (1,409) (1,610) <sup>B</sup>	3	Tram	100	1,320
Signalled intersection	3	20	884	1,061	1,179	1,263	1,326	1,374	1,414					
Roundabout	..	2	0	889	1,067	1,185	1,270	1,333	1,383	1,422				
Signalled intersection	2	10	916	1,099	1,221	1,308	1,374	1,425	1,466	2	Bustrolleybus	50	1,499	
Roundabout	..	3	40	972	1,166	1,296	1,389 (1,409) <sup>A</sup>	1,458	1,512	1,555	2	Tram	20	1,533
Roundabout	..	3	30	1,014	1,217	1,352 (1,409) <sup>A</sup>	1,449	1,521	1,577 (1,610) <sup>B</sup>	1,622				
Roundabout	..	3	20	1,060	1,272	1,413 (1,409) <sup>A</sup>	1,514	1,590 (1,610) <sup>B</sup>	1,649	1,696	2	Bustrolleybus	20	1,632
Signalled intersection	2	0	1,090	1,308	1,453	1,557	1,635	1,695	1,744					
Roundabout	..	3	10	1,111	1,333	1,481	1,587 (1,610) <sup>B</sup>	1,666	1,728	1,777				
Roundabout	..	3	0	1,166	1,399 (1,409) <sup>A</sup>	1,555	1,665	1,749	1,814	1,865	2	None	0	1,811
Roundabout	..	4	40	1,182	1,418	1,576 (1,610) <sup>B</sup>	1,689	1,773	1,838	1,891				
Roundabout	..	4	30	1,233	1,479	1,644	1,761	1,849	1,918	1,973				
Signalled intersection	3	10	1,245	1,494	1,660	1,779	1,867	1,937	1,992					
Roundabout	..	4	20	1,290	1,548 (1,610) <sup>B</sup>	1,720	1,843	1,935	2,007	2,064	3	Tram	50	2,098
Roundabout	..	4	10	1,350	1,621	1,801	1,930	2,026	2,102	2,161				
Modified flyover	..	2	High	A(1,409)	1,701	1,891	2,025	2,127	2,206	2,269				
Roundabout	..	4	0	1,418							3	Bustrolleybus	100	2,318
Signalled intersection	4	10	1,484	1,781	1,979	2,120	2,226	2,308	2,374					
Modified flyover	..	2	Low	1,610							3	Tram	20	2,565
Cloverleaf	..	2	All								3	Bustrolleybus	50	2,583
Signalled intersection	3	0	1,635	1,962	2,180	2,336	2,452	2,543	2,616		3	Bustrolleybus	20	2,737
				(2,278) <sup>C</sup>	(2,278) <sup>C</sup>	(2,603) <sup>D</sup>	(2,603) <sup>D</sup>	(2,603) <sup>D</sup>	(2,832) <sup>E</sup>					
Signalled intersection	4	0	2,180	2,616	2,907	3,114	3,270	3,391	3,488		3	None	0	2,929
Modified flyover	..	3	High	2,278							2,603) <sup>D</sup>			
Modified flyover	..	3	Low	2,603							(2,832) <sup>E</sup>			
Cloverleaf	..	3	All								(2,832) <sup>F</sup>			
Modified flyover	..	4	High	2,832	2,832						(3,238) <sup>F</sup>			
Modified flyover	..	4	Low	3,238	3,238	3,238	3,238							
Cloverleaf	..	4	All											

\* In approach to signalled intersection from one direction or In roundabout throat or In through road of flyover from one direction  
Note.—Flyover capacities do not vary with ratios of cross flow

Capacities in brackets refer to:

- A. 2-lane modified flyover with high percentage of right-turn traffic
- B. 2-lane modified flyover with low percentage of right-turn traffic or 2-lane cloverleaf
- C. 3-lane modified flyover with high percentage of right-turn traffic
- D. 3-lane modified flyover with low percentage of right-turn traffic or 3-lane cloverleaf
- E. 4-lane modified flyover with high percentage of right-turn traffic
- F. 4-lane modified flyover with low percentage of right-turn traffic or 4-lane cloverleaf

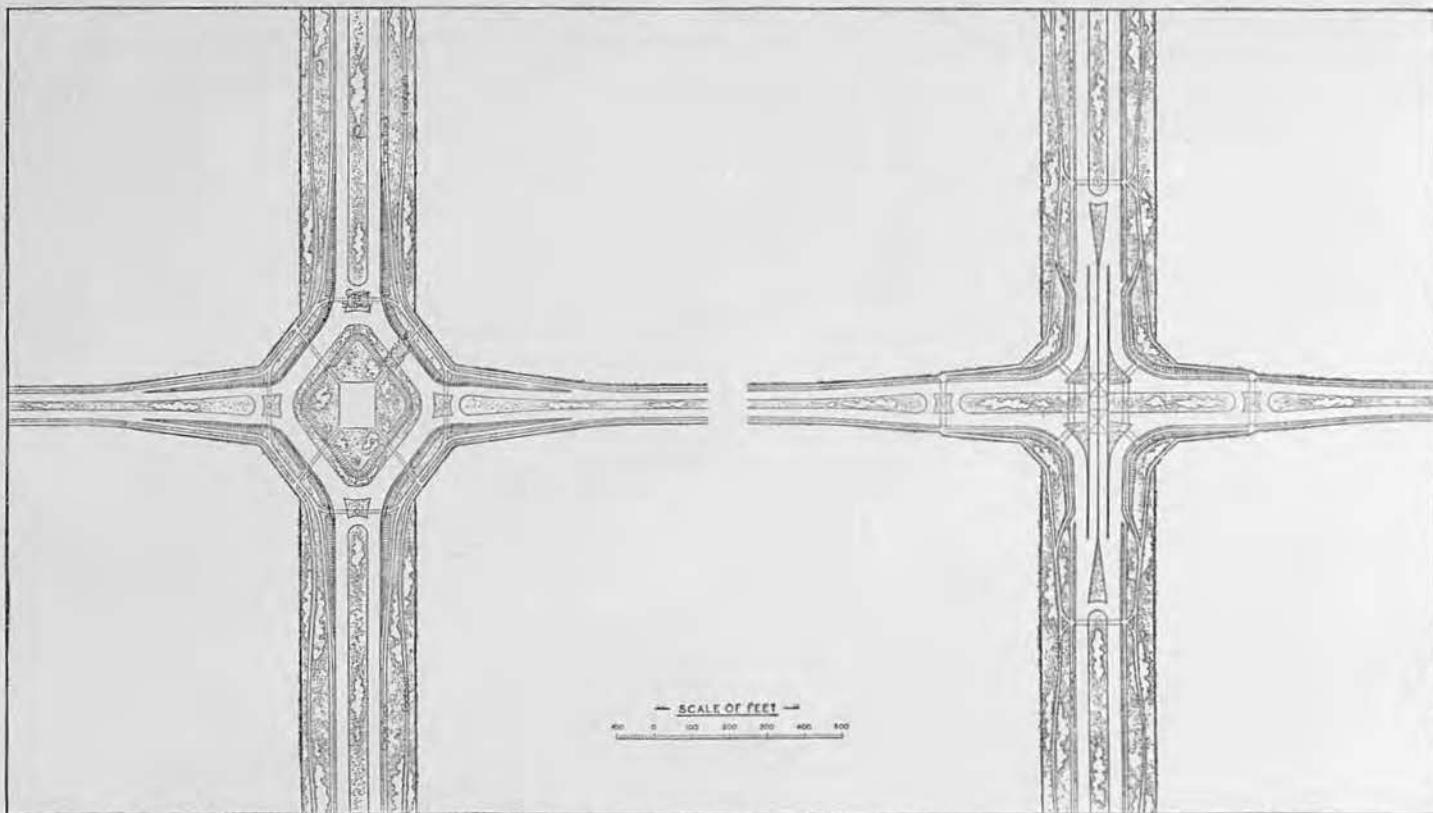


Fig. 20. TRAFFIC JUNCTIONS. The left-hand diagram shows a raised roundabout; cyclists and pedestrians cross under the junction in separate subways. The right-hand diagram shows a flyover junction in which the parkway carriage-way is raised 10 feet above natural ground level, and the major local road is excavated to a similar depth.

seven feet six inches, but efforts are being made—so far without success—to secure an increase to eight feet. The 12-foot lane would be capable of taking this wider vehicle, but even with the present width this figure should not be reduced if traffic-lane capacity is to be fully developed. [419]

In applying the results of the foregoing research work to the determination of carriageway widths and junction designs for the peak-hour traffic flow which the regional roads may be expected to carry, there remains one major uncertainty, i.e., where two or more highways offer equally convenient routes for a considerable volume of traffic, and their relative popularity cannot be precisely forecast. In such cases ample verges should be provided for ultimate conversion into extra traffic lanes if and when the need becomes evident. [420]

It is not, of course, suggested that carriageways up to the full width indicated by the traffic calculations should be constructed forthwith. Steps should, however, be taken to secure as part of development or redevelopment proposals that sufficient land is reserved to enable extra traffic lanes to be added at a later date when traffic growth requires. In the

interim, any such reserves will doubtless be grassed and planted. [421]

It will be realised that carriageways have to be designed in traffic-lane units, and hence in most cases they will be capable of taking more than the future traffic forecast for them; also, if reasonable amenities are provided in the form of grass verges and central reservations, part conversion of these grassed areas can provide an extra traffic lane in each direction. Thus ample provision for an excess of traffic over that which can now be foreseen will be available should ever the need arise. [422]

In Table 11 particulars of traffic flows for a representative selection of roads throughout the region are given, with the peak-hour figures for 1938 and those expected in 1970, or thereabouts, together with the carriageways which will be required by the latter. [423]

### MAIN PROVISIONS

To meet the defects of the present system and to provide for the traffic flows discussed in the preceding paragraphs the essentials of the road plan are:

Table 11 PEAK TRAFFIC FLOWS IN ONE DIRECTION

District	Road (figures in brackets refer to road numbers on Plates 20 and 21)	1938 peak flow in one direction	Estimated ultimate peak flow (1970) in one direction	Ratio of ultimate peak flow to 1938 peak flow	Number of traffic lanes proposed in each direction	Estimated capacity in one direction of proposed road	Ratio of capacity of proposed road to 1938 peak flow
		Vehicles per hour	Vehicles per hour	(b) / (a)		(c)*	(c) / (a)
MANCHESTER	Cheetham Hill Road (1)						
	North of Intermediate Ring Road	800	1,702	2.1	3	2,462	3.1
	South of Intermediate Ring Road	850	1,370	1.6	2	1,496	1.8
	Oldham Road (4)	830	1,868	2.2	3	2,294	2.8
	Princess Parkway (12)						
	South of Barlow Moor Road (14)	780	3,000	3.8	4	3,735	4.8
	North of Wilbraham Road (D/23)	840	1,780	2.1	3	2,581	3.1
	Stockport Road (9)						
	South of Road D/23	810	2,700	3.3	4	3,640	4.5
	South of Inner Ring Road	1,230	1,900	1.5	3	2,462	2.0
SALFORD	Broad Street (18)						
	West of Intermediate Ring Road	1,526	2,205	1.4	3	2,316	1.5
	East of Intermediate Ring Road	1,150	1,655	1.4	3	2,238	1.9
	Eccles New Road (17)	450	1,770	3.9	3	2,613	5.8
ECCLES	Regent Road Bridge (17)	438	1,082	2.5	2	1,616	3.7
	Liverpool Road (17)						
	East of Shakespeare Crescent	377	494	1.3	1½	854	2.3
MIDDLETON	Eccles Market Place	522	1,414	2.7	2	1,624	3.1
	Barton Lane (27)	145	754	5.2	1½	854	5.9
	Rochdale Road (2)						
PRESTWICH	Stanycliffe	239	166	0.7	1½	864	3.6
	Manchester New Road (2)	274	768	2.8	2	1,523	5.6
	Heywood (Old) Road (1)	83	398	4.8	1½	873	10.5
STRETFORD	Bury New Road (19)	446	506	1.1	1½	836	1.9
	Bury Old Road	371	195	0.5	1½	845	2.3
	Sheepfoot Lane (29/1)	256	352	1.4	1½	891	3.5
SWINTON and PENDLEBURY	Chester Road (16)						
	South of "Old Cock" Hotel	1,283	2,065	1.6	3	2,630	2.1
	Gorsehill	526	1,257	2.4	2	1,496	2.8
AUDENSHAW	Talbot Road (15)	797	613	0.8	1½	877	1.1
	Bolton Road (29)						
	East of Station Road	469	1,120	2.4	2	1,565	3.2
DENTON	Chorley Road						
	East of Worsley Road	373	784	2.1	2	1,496	4.0
	Station Road	146	359	2.5	1½	787	5.4
DROYLSDEN FAILSWORTH	Ashton Road (7)	531	1,169	2.2	2	1,588	3.0
	Manchester Road (7)	215	422	2.0	1½	882	4.1
	Droylsden Road (6)	313	744	2.4	1½	828	2.6
IRLAM	Manchester Road (8)						
	West of Outer Ring Road	421	1,114	2.6	2	1,602	3.8
	Hyde Road (8)						
WORSLEY	East of Crown Point	289	693	2.4	1½	822	2.8
	Ashton Lane (24)	226	256	1.1	1½	864	3.8
	Manchester Road (6)	551	1,076	2.0	2	1,607	2.9
URMSTON	Oldham Road (4)						
	East of Broadway (23)	608	702	1.2	2	1,514	2.5
	West of Broadway	796	1,190	1.5	3	2,574	3.2
WORSLEY	Broadway (23)	186	817	4.4	2	1,652	8.9
	Liverpool Road (17)						
	at Eccles Boundary	248	157	0.6	1½	855	3.4
WORSLEY	Irlam By-pass (27)	—	312	—	1½	900	—
	Barton Lane (26)						
	North of Outer Ring Road	320	792	2.5	2	1,634	5.1
WORSLEY	Stretford Road						
	East of Davyhulme Circle	357	300	0.8	1½	837	2.3
	Croftsbank Road	172	444	2.6	1½	846	4.9
WORSLEY	Road A.6 Diversion (29)						
	West of Outer Ring Road	—	977	—	2	1,680	—
	Walkden Road	288	880	3.1	2	1,514	5.2
WORSLEY	East Lancs. Road (18)						
	West of Outer Ring Road	457	1,889	4.1	3	2,715	5.9
	East of Outer Ring Road	457	1,028	2.3	2	1,643	3.6

\* Figures in column (c) allow for losses due to public-service vehicles

- (i) a system of radial and ring roads of sufficient capacity to accommodate the ultimate traffic in the regional area;
- (ii) the separation of long-distance and through traffic from that of a purely local character, and the canalisation of the former into selected major routes, thereby freeing residential communities and shopping centres for the quiet enjoyment of their normal uses;
- (iii) road junctions to provide adequately for the calculated traffic flows, with flyover crossings at the most heavily used junctions; with twice the present volumes, the only way in which traffic can be passed through the road system is by constructing junctions of such design and dimensions as will ensure smooth movement;
- (iv) the sealing off of many existing minor-road intersections with main roads to prevent the interruption of smooth traffic flows between major junctions;
- (v) provision of car-parking facilities to eliminate standing vehicles; for this purpose also direct access from premises fronting on to major traffic routes must be prohibited (as development or redevelopment occurs); and
- (vi) the provision of pedestrian subways under major roads, especially as means of egress from railway and bus stations. [424]

#### Road design

Plate 16, facing page 78, shows typical cross-sections of several classes of roads. Parkway treatment is a means not only of providing a landscape setting for the more important road approaches to the regional centre, but of bringing wedges of open space into the built-up areas in the intermediate and central zones—where the provision of extensive areas of open space of other types is not easily to be achieved—and at the same time linking up parts of the regional open-space system with the open country outside, so as to create an element of continuity which will markedly enhance their individual value. [425]

Parkway treatment is proposed for the Intermediate Ring Road, Princess Parkway and sections of the Outer Ring Road where the latter passes through areas either already built up or likely to be developed. The full parkway width would in general only be secured in the normal course of

long-term redevelopment. There may be less need for full parkway reservation on lands by nature unsuitable for building purposes, as the open character of such bordering lands will in any case be preserved. [426]

In the case of some other major roads in the regional system consideration should be given to extending the parkway system or, alternatively, adopting a modified layout of about 200 feet in width. In the remaining major roads the provision of grass verges planted with trees and shrubs will add colour and relief to the severity of wide expanses of asphalt and other paving. [427]

#### DESCRIPTION OF PRINCIPAL ROADS

In conjunction with the following notes, Plates 20 and 21, facing pages 87 and 94, should be examined. [428]

##### Ring roads

*The Outer Ring Road (D)* will be of great importance in diverting long-distance traffic from the built-up areas of the region. It will provide a direct route to Trafford Park from the north, west and south; it combines the functions of the following hitherto discontinuous pre-war road planning proposals:

- (i) the Yorkshire extension of the East Lancashire Road (part of the Liverpool-Leeds-Hull route);
- (ii) the Bolton-Sale Road (a westerly by-pass of the region for traffic between Central Lancashire, Cheshire and the South);
- (iii) the Western Parkway, which in conjunction with (ii) was intended to form a diversion to the south and west of Manchester for the London-Carlisle-Glasgow Road (A.6);
- (iv) the Eastern By-pass (a continuation southwards of Broadway from Failsworth to Heaton Moor, Stockport, for traffic from Rochdale and Oldham to Stockport and the Midlands);
- (v) an east-west road in North Cheshire (from Road A.6 south-east of Stockport passing Ringway Airport and linking North-East Cheshire and Derbyshire with North Wales). [429]

The Outer Ring Road will thus not only relieve traffic congestion within the Manchester region,

but will also be of great value in the highway system of the adjacent areas. It has, for the greater part of its length, been located within the proposed green belt in order to avoid drastic cuts through recently-built-up areas; thus the road line is somewhat irregular in plan. However, its location will enable its function as an unobstructed long-distance traffic route to be easily secured, and an amenity of layout to be provided on a scale which its importance undoubtedly warrants. [430]

Some sections lie outside the regional planning boundary—notably on the east and south-east sides of Stockport. These have, therefore, been planned in co-operation with the neighbouring planning authorities. [431]

Commencing from a flyover junction with the East Lancashire Road (18) at Roe Green, Worsley, the road incorporates the route of the proposed Liverpool-Leeds-Hull Road, crosses the River Irwell near Molyneux Junction (Clifton-Bury Line) and passes up Mere Clough to an undercrossing of Bury New Road (19) at Phillips Park Road, and under Bury Old Road near Besses o' th' Barn Station (Manchester-Whitefield line). Near Heaton Park reservoir the ring road is intersected by the proposed eastern by-pass of Whitefield (21)—itself part of a diversion of route A.56 on the east side of Bury. At this intersection the Outer Ring Road leaves the route of the Leeds-Hull Road (22), turns south-eastwards to Heaton Park Road, joins Victoria Avenue near its junction with Rochdale Road (2), following Victoria Avenue to its junction with Broadway (23). Passing out of the Manchester regional planning area by Hollinwood Avenue, the route follows Bower Lane, Hollinwood, to a junction with Oldham Road (4), and then turns southwards within the Oldham and District regional planning area, passing Crime Lake and Daisy Nook, where careful landscape treatment is intended. The route re-enters the Manchester region near Droylsden Station (L.M.S.R.), follows the common boundary of Droylsden and Audenshaw and passes along the western side of Audenshaw reservoirs to a junction with the Manchester-Hyde Road (8). It leaves the region again at Beight Bridge, Denton (River Tame), passes over Castle Hill to Bredbury and crosses the River Goyt to Foggbrook, on the Stockport-Marple road (A.626). It skirts the east side of Hazel Grove to a junction upon the Buxton Road (9), thus by-passing Stock-

port. It then turns west, passing between Hazel Grove and Poynton, and south of Bramhall to a junction with the Manchester-Wilmslow road (A.34), the proposed Wilmslow by-pass, and the Kingsway extension (10) at the northern boundary of Handforth. [432]

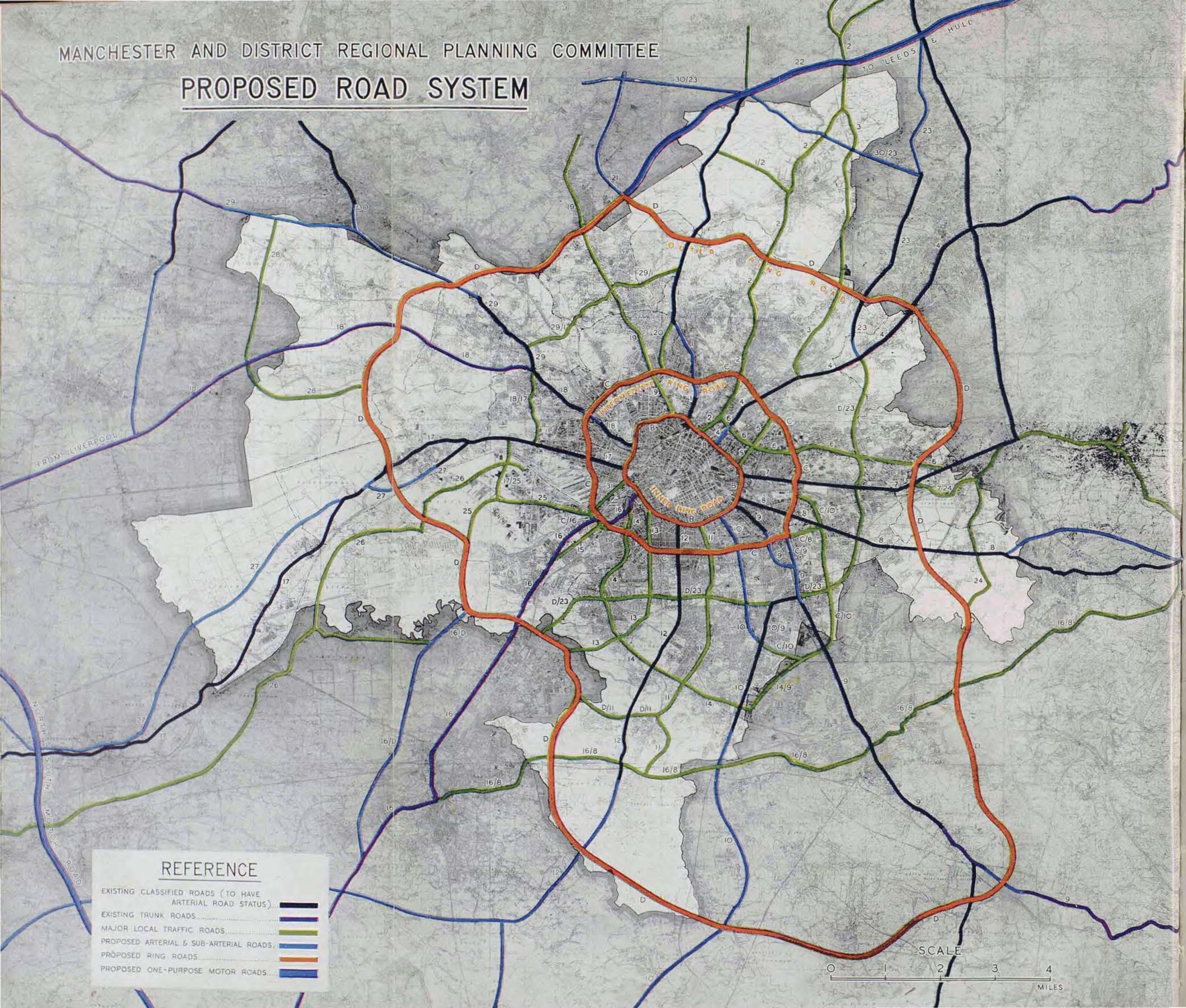
Re-entering the region at Moss Nook, Wythenshawe, the ring road embodies the Western Parkway and skirts the north side of Ringway Airport to a junction with Princess Parkway (12)—the principal outlet from Manchester to Cheshire and the South. It then follows the common boundary of Wythenshawe with Hale, Altrincham and Sale, lying within the latter borough from the Northenden-Sale road (D/11) to the crossing of the River Mersey into Stretford, where a junction with the Manchester-Chester trunk road (16) may be required north of Crossford Bridge. Here it absorbs the routes of the Bolton-Sale road and the Altrincham-Sale by-pass of Road A.56. This bypass (16/D) leaves it half a mile west of Chester Road, and the ring road turns northwards to skirt Barton Dock and Trafford Park industrial estates, to which access is given at Lostock Circle (25) on Barton Road (A.575), and at Davyhulme, via Redclyffe Road (26). A high-level bridge carries it over the Ship Canal to Peel Green, on the west side of Eccles, where linkage is provided with a proposed by-pass (27) of the Liverpool-Warrington-Manchester road (A.57). Continuing northwards along the western boundary of Eccles, past Worsley Court House, the road links up again with the East Lancashire Road (18) at the commencement of the Leeds-Hull road. [433]

*The Intermediate Ring Road (C)* is intended to be the principal circulating road within the built-up inner portions of the region, and is located at an average distance of  $1\frac{1}{4}$  miles from the centre. It will effectively link up the principal industrial areas, the two proposed railway goods terminals, the five sub-depots (referred to in Chapter VIII), and the docks, enabling industrial traffic on the radial roads to reach them without entering the central areas. It also provides rapid communication around the circumference of the latter areas for traffic between the district centres of the outer parts of the region. It is planned ultimately to become a major parkway, linking up the wedges of open space which radiate towards the regional boundary and the green belt (see Plate 13, facing page 46). [434]



MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE

## PROPOSED ROAD SYSTEM



The route embodies some existing sections of quasi-ring roads, which have hitherto lacked continuity. Commencing in Broad Street, Salford (18), it follows Cromwell Road, Great Cheetham Street and Elizabeth Street to Cheetham Hill Road (1)—where an already well-used by-pass route is incorporated—following Queen's Road, Lamb Lane, Hulme Hall Lane, Mill Street, Pottery Lane, and Kirkmanshulme Lane to Stockport Road (radial 9). The route passes south of Whitworth Park to Alexandra Park (at Greame Street), traversing an area much of which is due for redevelopment at an early date. Continuing through Stretford, it passes between Hullard Park and Seymour Park to a major traffic junction at Trafford Bar, where access to Trafford Park is provided, together with a connection to the Manchester-Chester road (16). It is then carried over the Ship Canal by a high-level bridge situated just to the east of the present Trafford Road swing bridge, and joins Trafford Road at Ordsall Park, where a direct connection to the docks is made. (Its importance as a much-needed relief road for the approaches to the docks and the eastern end of Trafford Park has already been explained in the analysis of dock traffic.) North of Broadway (Salford) the road deviates west of the line of Trafford Road, leaving intact the existing shopping and commercial frontages of that road and Cross Lane, and traverses redevelopment areas south and north of Eccles New Road (17) to rejoin Broad Street (18) at St. Thomas's Church. [435]

*The Inner Ring Road (B)* will primarily intercept and distribute around the circumference of the commercial core of Manchester and Salford all traffic of a semi-through character arriving by the radial roads 1 to 19, or originating from the areas through which it passes, thus keeping out of the city centres all traffic not actually destined for the inner area. At the same time the road will provide good circulation between the two cities, and a rapid means of distribution from the principal railway goods terminals to the warehouse and commercial areas. [436]

In Salford it follows the general line of Adelphi Street, Silk Street and St. Simon Street, crossing the River Irwell into Manchester at the south-eastern corner of the Assize Courts (Strangeways) to join Cheetham Hill Road (1) at the Victoria Station bridge. The route then follows Miller Street, Great

Ancoats Street, and Pin Mill Brow to a junction with Ashton Old Road (7) where access to the Ardwick goods terminal is given. It continues southwards past Ardwick Cemetery to Stockport Road (9), passes through areas of obsolete development south of the Church of the Holy Name in Oxford Road, and of Hulme Hippodrome in Preston Street, connecting with radial road 13 near the present junction of Stretford Road and Chorlton Road. It then intersects Chester Road (16) to follow Hulme Hall Road and cross the River Irwell into Salford (at the terminus of the Ship Canal navigation at Woden Street footbridge) to the junction of Oldfield Road and Ordsall Lane—the latter providing a branch connection (31) to the docks. Turning north, the ring road incorporates Oldfield Road, crosses Regent Road (17), and passes along the eastern boundary of the proposed Windsor goods terminal to rejoin Adelphi Street at its junction with Chapel Street (18). [437]

*The City Circle Road (A)* is essentially a traffic-collecting and distributing road for the shopping and administrative areas in the regional centre. Its early construction would greatly reduce traffic congestion therein and forestall the total strangulation of vehicular movements which must otherwise speedily follow on an increasing general use of private cars at the conclusion of the war. The route has been selected to take advantage of war-damaged sites, although these are sporadically distributed. It links up the main railway passenger terminals and the sites of the proposed bus and trolley-bus stations. It also enables traffic arriving by the radial roads and destined for the central core to select the most convenient point of entry into its street system, which should be made otherwise unattractive to traffic attempting short cuts across the city. [438]

The route lies wholly within Manchester, and provides by-passes to Deansgate (A.56) and Market Street (A.6)—both busy shopping areas—relieving them of their through traffic and making them safe for the shopping public. It follows Cannon Street, Church Street, Portland Street, Chepstow Street, Great Bridgewater Street, Liverpool Road, Lower Byrom Street and St. Mary's Parsonage, and encloses an area roughly elliptical in form, of which the major axis would be less than one mile and the width about half a mile. [439]

## Principal radial roads

1. This is intended to fulfil two main functions:
  - (a) to make a direct connection between the central areas of Manchester and Salford and the intersection of the Liverpool-Leeds-Hull Road (22) with the Bolton-Oldham Road (30/23),
  - (b) in combination with a section of the Outer Ring Road at Heaton Park and the eastern by-pass of Whitefield and Bury (21), to provide a very necessary relief route for the present line of Road A.56 (which passes through the centres of Prestwich, Whitefield and Bury) carrying the heavy industrial traffic from the East Lancashire towns and from Yorkshire. [440]

Starting from a modified flyover junction at the intersection mentioned in (a) above, the route follows Heywood (Old) Road and Middleton Road (forming a junction with the Outer Ring Road at Heaton Park Road) and Cheetham Hill Road (with a by-pass north of the shopping area thereon) to a junction with the Inner Ring Road adjoining Victoria (L.M.S.) Station. Continuing inside the Inner Ring it follows New Bridge Street, crosses the River Irwell into Salford to Greengate, flanks the proposed Trinity Station (see Chapter VIII) and re-crosses the Irwell at Victoria Bridge Street to terminate on the City Circle Road. [441]

4. Follows Oldham Road, the main link between Oldham and Manchester, and at present part of the Liverpool-Manchester-Leeds-Hull trunk road, pending the construction of the proposed diversion of this route around the north side of the Manchester region and the provision of a new crossing (22) over the Pennines. The section of Oldham Road within the region carries a heavy shuttle traffic between the two county boroughs which will continue after the trunk road traffic has been diverted. In conjunction with Roads 22 and 23 (referred to later), Road 4 will provide a feeder from the north-east between the new route of the Liverpool-Leeds-Hull trunk road and the industrial areas in the eastern parts of Manchester. Inside the Intermediate Ring Road it is diverted from the present line of Oldham Road (so avoiding the congested areas adjoining Oldham Road Goods Station and the busy shopping area of Oldham Street) to link up with the City Circle Road at Port Street. [442]

7.—The Manchester-Ashton (Old) Road carries mainly local traffic to and from Ashton-under-Lyne and Stalybridge. A loop-road (17) is proposed to by-pass the congested section of the existing road at Fairfield Street and its continuation across the city via Whitworth Street and Liverpool Road to Salford. [443]

8.—Hyde Road carries the Sheffield to Manchester and Liverpool traffic (via Hyde). (A north-easterly by-pass of Hyde is under consideration by the East Cheshire Regional Committee, terminating in Denton at the junction of St. Anne's Road with the Manchester-Hyde Road.) In conjunction with the Outer Ring Road between Hazel Grove and Hyde Road, Denton, this radial forms a relief route round the east and north of Stockport for traffic from residential areas in the Macclesfield district of Cheshire, and for traffic from Derbyshire to Manchester. It terminates on the City Circle Road at Piccadilly. [444]

9.—Stockport Road is part of the London-Derby-Manchester-Carlisle Road (A.6) and in addition to long-distance traffic carries heavy local traffic between the centres of Manchester and Stockport. Included in this is a high percentage of public-service vehicles. Stockport Road passes through long-established district shopping centres at Longsight and Levenshulme, and by-passes for these two sections of the route are proposed. In addition, to reduce the traffic intensity which would otherwise develop, relief roads are proposed (C/10), to divert traffic at a point south of the regional boundary at Heaton Moor. One branch of this relief route would take traffic for the industrial zones on the east side of the central area and for the north side of the region by way of the Intermediate Ring Road. This route follows the line of Mount Road. The other branch connects with Mauldeth Road (10). [445]

Within the region Road 9 bifurcates at Crowcroft Park. The main traffic flow is diverted to a by-pass of the existing shopping centre between Slade Lane and Ardwick Green; the remainder, consisting of that traffic from Kingsway which is not destined for the centre, is carried by a new link (C/9) to the east of the L.M.S. Stockport line, to connect with the Intermediate Ring Road at Kirkmanshulme Lane. Even with these reliefs, the ultimate growth of traffic on Road 9 will necessitate the construction of a flyover for the incoming Hyde Road traffic at its junction with Road 8 at Ardwick Green. [446]

10.—An important artery from the residential districts of Alderley Edge, Wilmslow, Cheadle and Gatley, intended to remove from the existing Road A.34 (Oxford Road and Wilmslow Road, Manchester) the through traffic from the Potteries and Midlands to South and East Manchester. Road A.34 passes through local shopping centres in Cheadle (Cheshire), Didsbury, Withington and Rusholme, and then traverses the city's medical and educational centres, to enter the Oxford Street shopping and theatre centre. Not only would adequate improvement of the route through these centres be extremely costly and long-delayed, but the continuance of heavy traffic streams would permanently conflict with their prime functions; the development of the parallel routes 10 and 11 (respectively following Anson Road, Upper Brook Street and Princess Street, and Lloyd Street and Higher Cambridge Street) will free those centres adjoining Oxford Road of through traffic, and will be less costly improvements. Before the war agreement had been reached with the Cheshire County Council for the extension of Kingsway (Manchester) to the existing Wilmslow Road south of Cheadle, as a by-pass for the congested centre of the latter. This extension is to be continued in Cheshire, by-passing Wilmslow and Alderley Edge. [447]

The northern end of Kingsway, however, terminates at present on Stockport Road (9) at Slade Lane. Additional traffic from A.34 at this junction would aggravate the congestion which the treatment of Road 9 is intended to avoid. The traffic flow on Kingsway is, therefore, bifurcated at Mauldeth Road, the city-bound traffic being bypassed west of Platt Fields through Anson Road and Upper Brook Street, to join the City Circle Road at Princess Street. Traffic for the northern and eastern parts of the region would continue along Kingsway (10/9) as far as its intersection with Moseley Road (D/23), proceeding to the Intermediate Ring Road by way of Roads 9 and C/9, or to the north-east of the region by Road 23. An easterly extension of Barlow Moor Road (14) to connect with Kingsway provides a relief route for traffic to the docks, Trafford Park and north-west parts of the region. [448]

12.—Princess Parkway would form the principal connection between the regional centre and Ringway Airport, and would be the main southern

approach. From its junction with the Outer Ring Road, at the north-west corner of the airport, the route is continued southwards into Cheshire across the River Bollin to a junction from which diverge the proposed east-west route to North Wales and a southward link passing on the east side of Knutsford to the projected North-South Motor Road. Princess Parkway will also act as the main artery for suburban traffic from Wythenshawe and from any future residential development beyond the green belt in North Cheshire. [449]

In view of its importance, the road is planned as a major parkway with under- or over-passes at major crossings. The section between the Altrincham-Stockport road (16/8) and the Inner Ring Road is already in use, with parkway treatment upon the length south of the River Mersey. At its northern end the route will terminate on the City Circle Road close to the civic centre. The time occupied in the journey from Ringway Airport along this unobstructed route to the centre is expected to be not more than 15 minutes. [450]

16.—Chester Road carries long-distance traffic on the Swansea-Chester-Manchester trunk road. It is the only existing main approach from North Wales and, pending the extension southwards of Road 12, it carries traffic from the South and the Midlands to Manchester, Trafford Park and the docks, and to Lancashire towns north of the region. In addition to this long-distance traffic, there is a heavy local traffic including bus services in and out of the region to Sale, Altrincham and the adjacent dormitory areas. In Stretford, a considerable portion of the city-bound traffic bypasses the junction serving the docks and the east end of Trafford Park by using Talbot Road (15), rejoining Chester Road at Trafford Bar, where a "scissors" crossing causes severe traffic congestion. Although the long-distance traffic will be removed from the centres of Sale and Altrincham by a westerly by-pass (16/D), terminating on the Outer Ring Road, much of the long-distance traffic bound for the central areas may turn off the Ring Road again at its junction with Chester Road, and continue on the latter to Trafford Bar. Consideration is now being given to an alternative to the passage of this traffic through Stretford on the existing road. The Intermediate Ring Road crosses this radial at Trafford Bar by the proposed high-level bridge over the Ship Canal, with connections

by a large roundabout at the viaduct approach from the radial and from Talbot Road (15). [451]

Both Stretford Road (A.5607) and City Road, Manchester (A.5608), are relieved of their through traffic, which is confined to Chester Road up to the intersection of Road 17 at Egerton Street. At this point traffic is diverted from Deansgate by a short viaduct by-pass across the Castlefield Basin, to join the City Circle Road at the junction of Liverpool Road with Lower Byrom Street. [452]

17.—This road mainly follows the line of the existing Liverpool-Warrington-Salford road, with by-passes of the centres of Irlam and Eccles. West of Irlam it links up with a proposed Warrington ring road, at its connection with the projected North-South Motor Road. The existing Liverpool Road through Irlam cannot be adequately improved except by the demolition of its principal business frontages. Also, the particular physical conditions resulting from the presence of moss-land, limiting the development area along the north side of Irlam, and of the Ship Canal (with associated industrial development) along its south side, make it undesirable to sever the elongated form of the town by a wide traffic artery. After extensive investigation of subsoil conditions, a route for a by-pass closely skirting the northern boundary of the developed area has been evolved (27). [453]

In Eccles the route passes under the northern approach to the proposed high-level bridge carrying the Outer Ring Road over the Ship Canal, and under Worsley Road (A.575) and the Bridgewater Canal to join Barton Lane (B.5230). The by-pass (27) rejoins the existing line of Liverpool Road at Eccles Market Place. At Regent Bridge, on the Manchester-Salford boundary, the route is diverted south of the commercial centre of Manchester by a loop road following Dawson Street and Egerton Street, and passing south of Gaythorn gasworks and north of All Saints to Tipping Street and Pin Mill Brow, where it joins Ashton Old Road (7) at its junction with the Inner Ring Road. This will provide a direct link between the proposed railway goods terminals at Windsor (Salford) and Ardwick (Manchester) and will serve the industrial and warehouse zones in Salford and Manchester. From Regent Bridge also, a link (17/A), following Water Street and Liverpool Road, connects with the City Circle Road. [454]

The possibility of providing additional road access to Trafford Park from Salford and Eccles has been considered. Long-distance traffic movement has been provided for by the Outer and Intermediate Ring Roads, but there has long been a need for more local access for workers living north of the Ship Canal. The most practicable solution appears to be a local link (17/25) from Road 17 at the junction of Stott Lane, crossing the Ship Canal by a low-level swing bridge, to Trafford Park Road and Tenax Road. The estimated cost of the swing bridge, with a viaduct over the railway sidings on the north bank and an approach road on the south bank, amounts to nearly £700,000. The proposal is one requiring further consideration in conjunction with the local transport authorities, so that the savings in transport costs which might result can be ascertained. [455]

18.—The East Lancashire Road is the principal artery between Liverpool and the region, being part of the Liverpool-Manchester-Leeds-Hull trunk road. The long-distance component of its traffic—which at present traverses the region either by way of Agecroft Bridge to Prestwich, Middleton and Rochdale, or passes through the central areas to Oldham Road—will in future be diverted at Roe Green, Worsley, on to the Outer Ring Road for Road 22 to Yorkshire. [456]

At the Swinton-Salford boundary the traffic on Roads A.6 (from Preston) and A.666 (from Bolton) joins with that from the East Lancashire Road (A.580), to make Bolton Road, Broad Street and Chapel Street, Salford, one of the most heavily-loaded routes in the region. The Intermediate Ring Road will remove much of the traffic not destined for the regional centre, but a relief road (18/17), on the line of Claremont Road, is proposed to reduce the volume to be handled at its intersection with Road 18 by tapping off traffic for the docks. [457]

In conjunction with the railway reconstruction proposals (referred to in Chapter VIII) the layout of the proposed Trinity Station will provide for two cross-river road links from Chapel Street, Salford, to the City Circle Road on the Manchester side of the Irwell. Of these, that on the line of New Bailey Street will provide the feeder to the central area for traffic arriving by Road 18. (The second, on the line of Greengate and Blackfriars Street, forms the final length of Road 1.) A link on the

north-west side of the proposed station, following the line of William Street (18/1) will carry traffic from Salford to the remote side of the regional centre by way of New Bridge Street and the Inner Ring Road. [458]

23.—Broadway, in conjunction with Oldham Road (4), forms an important feeder to Manchester from the north-east, making connection with Road 22 (Liverpool-Leeds-Hull road) at its intersection with the Rochdale-Oldham road (A.627). When Road 22 comes into being, the heavy industrial traffic between Yorkshire and the industrial areas of the Manchester region will use Roads 23 and 4. [459]

At its southern end a diversion of Broadway is proposed to permit the construction of an adequate roundabout at its junction with Oldham Road, and of a southerly continuation of Broadway itself (D/23), forming a distributing road through the area between the Intermediate and Outer ring roads and to the east, south-east and south. This link road D/23 passes across Clayton Vale, Ashton New Road (6), Ashton Old Road (7), Hyde Road (8) and Stockport Road (9). It then follows Moseley Road and Wilbraham Road, with junctions at Kingsway (10), Palatine Road (11), Princess Parkway (12), Withington Road (13), and Barlow Moor Road (14), and terminates at the Outer Ring Road (D) in Sale. [460]

29.—A diversion—at the north-west boundary of the region—of the London-Derby-Manchester-Preston-Carlisle-Glasgow trunk road (A.6) to relieve the central areas of Worsley and Swinton and Pendlebury. The route continues a proposed diversion in the adjacent regional area, and passes along the common boundary of Worsley with Farnworth and Kearsley to a junction with the Outer Ring Road at Clifton. Here the long-distance traffic will transfer to the ring road, to circulate around the north or south sides of the region according to destination. By a short link (30) the traffic on Bolton Road (A.666) is diverted to join Road 29 in Kearsley, to obtain access to the Outer Ring Road; at the same time the need for a major widening of the existing Bolton Road through Kearsley to Clifton is avoided. Road 30, in conjunction with Road 29 and the western section of the Outer Ring Road, will also form an easterly by-pass of Worsley town centre, providing an alternative route for traffic between Bolton,

Trafford Park, Sale and Altrincham. At present this traffic passes through the Walkden shopping area and the civic centre of Worsley (a town which will ultimately have a population of 70,000 persons) on Road A.575 to Barton swing bridge, and thence through Davyhulme to Chester Road, Stretford. The provision of a Bolton-Sale-Cheshire route is a long-felt necessity. This need can now be met by the Outer Ring Road (with its high-level bridge over the Ship Canal) and Roads 29 and 30. [461]

East of the intersection with the ring road, Road 29 rejoins the existing line of Bolton Road (A.666) at its junction with Station Road, Pendlebury (B.5231), and follows the existing road to its junction with Road 18 at the Salford boundary. The provision of a northerly by-pass of Pendlebury itself has been found impracticable. Not only is a new neighbourhood unit about to be undertaken in the Rake Lane area, but ground levels adjoining Pendlebury Station are totally unsuited to the construction of a road crossing over the railway line to rejoin A.666 near Irlams-o'-the'-Height. In following the existing road through an area which is mostly due for redevelopment, Road 29 will define the natural boundary between neighbourhood units north and south of Bolton Road. [462]

Other roads numbered in Plates 20 and 21 but not described in the foregoing notes are mainly the more important roads feeding into the centre from the outer districts of the region and those linking district centres with one another. Roads C/16, 18/17 and 31 are intended to provide access to the docks, in addition to the Intermediate Ring Road. Roads 16/25, 17/25, 25 and 26 will provide access into Trafford Park. [463]

## ESTATE ROADS

Consideration has been given to the extent to which byelaws relating to new streets may, with the local authority's consent, be relaxed in certain cases. The Ministry of Health's Housing Manual, 1944, states:

The sole function of most roads on a housing estate is to give access to the houses, and for these roads a carriageway of 16 feet is generally sufficient. In larger schemes there will be some roads which need a carriageway of 22 feet, especially if they are likely to become bus routes. For minor roads like culs-de-sac and quadrangles a satisfactory width is 13 feet. It is essential to have a footpath on one side of the road: the need for footpaths on both sides will depend on local conditions. A footpath should be at least six feet wide. [464]

Regulations contained in new street byelaws throughout the region vary considerably: it is desirable that a common standard should operate. The following schedule of relaxations—to be applied in the interests of good planning and where streets are not likely to be used generally for through traffic—has been approved in principle by the Regional Planning Committee (see also Fig. 21). Every endeavour should be made to persuade estate developers to lay out their roads to a sufficient width to provide for adequate grass verges planted with trees or flowering shrubs.

Wherever possible the verges should not be less than seven feet in width. Where they are less than five feet, grassing should not necessarily be attempted. They may be more easily maintained if heavily planted with shrubs.

[465]

## CONCLUSION

The objectives set forth in this chapter will generally be secured only under a long-term planning programme; but the road proposals must be so planned that these conditions will ultimately

### RELAXATION OF NEW STREET BYELAWS

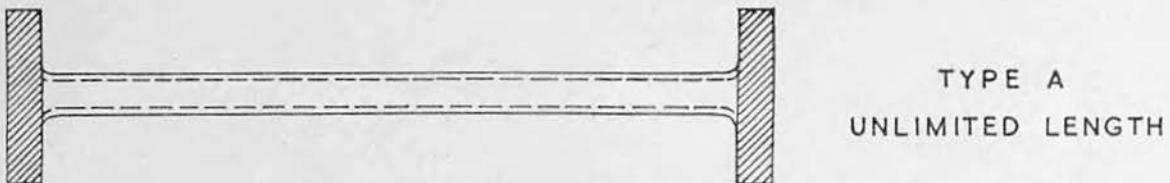
Suggested widths (Fig. 21)

Type	Maximum length (feet)	Minimum street width (feet)	Minimum carriageway width (feet)	Minimum footpath width (feet)	Remarks
A	Unlimited	As byelaws	24	8	The street shall communicate at each end with a street of maximum byelaw width and carriageway width, or with a highway having a carriageway existing and repairable by the inhabitants at large at the material date.*
B	1500	„	16	6	The street shall communicate at one end with a street of maximum byelaw width and carriageway width (and in the case of Manchester and Salford, with a street having a carriageway width of at least 24 feet) or with a highway having a carriageway existing and repairable by the inhabitants at large at the material date, and at the other end with any of such streets or highway.
C	600	„	16	6	The street may communicate at one end with a street of Type A or B or with a street of maximum byelaw width (and in the case of Manchester and Salford, with a street having a carriageway width of at least 24 feet) or with a highway having a carriageway existing and repairable by the inhabitants at large at the material date, and shall communicate with no other street. Minimum diameter of turning space to be 50 feet.
D	900	„	16	6	The street may communicate at one end with a street of Type A and at the other end with a street of Type G, if the length of the street together with the length of the street of Type G does not exceed 900 feet.
E	750	„	16	6	The street may communicate at one end with a street of Type B and at the other end with a street of Type G, if the length of the street together with the length of the street of Type G does not exceed 750 feet.
F & G	500	„	16	6	Applicable only to streets intended to give access solely to buildings forming three sides of a quadrangle or arranged in some other similar manner so as to front on to an open space. The quadrangle or open space should comprise not less than 1/12th of an acre.
H	250	„	13	6	The street shall communicate at one end with a street of Type A or B or with a street of maximum byelaw width (and in the case of Manchester and Salford with a street having a carriageway width of at least 24 feet) or with a highway having a carriageway existing and repairable by the inhabitants at large at the material date, and shall communicate with no other street. Minimum diameter of turning space to be 50 feet.
J	100	—	—	6	Footpath access only.

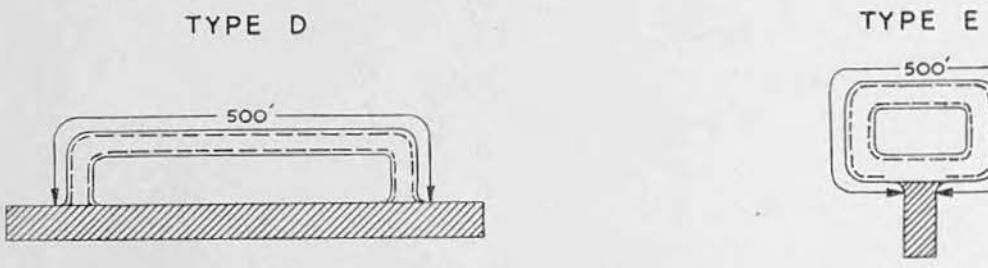
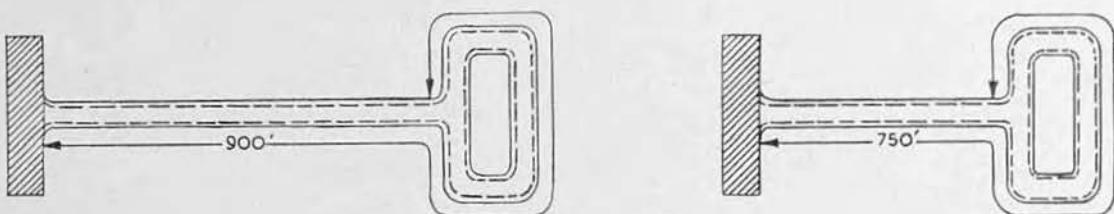
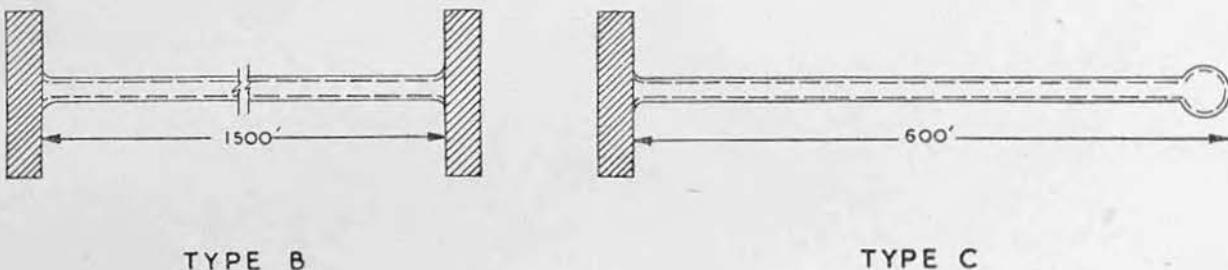
\* The material date is the date upon which a resolution to prepare a planning scheme became operative.

## ESTATE ROADS - SUGGESTED WIDTHS

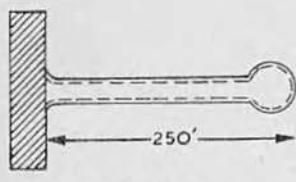
STREET 24'0" Carriageway, 8'0" Footpaths.



STREET 16'0" Carriageway, 6'0" Footpaths.



STREET, 13'0" Carriageway, 6'0" Footpaths



FOOTPATH ACCESS ONLY.

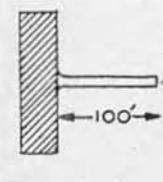


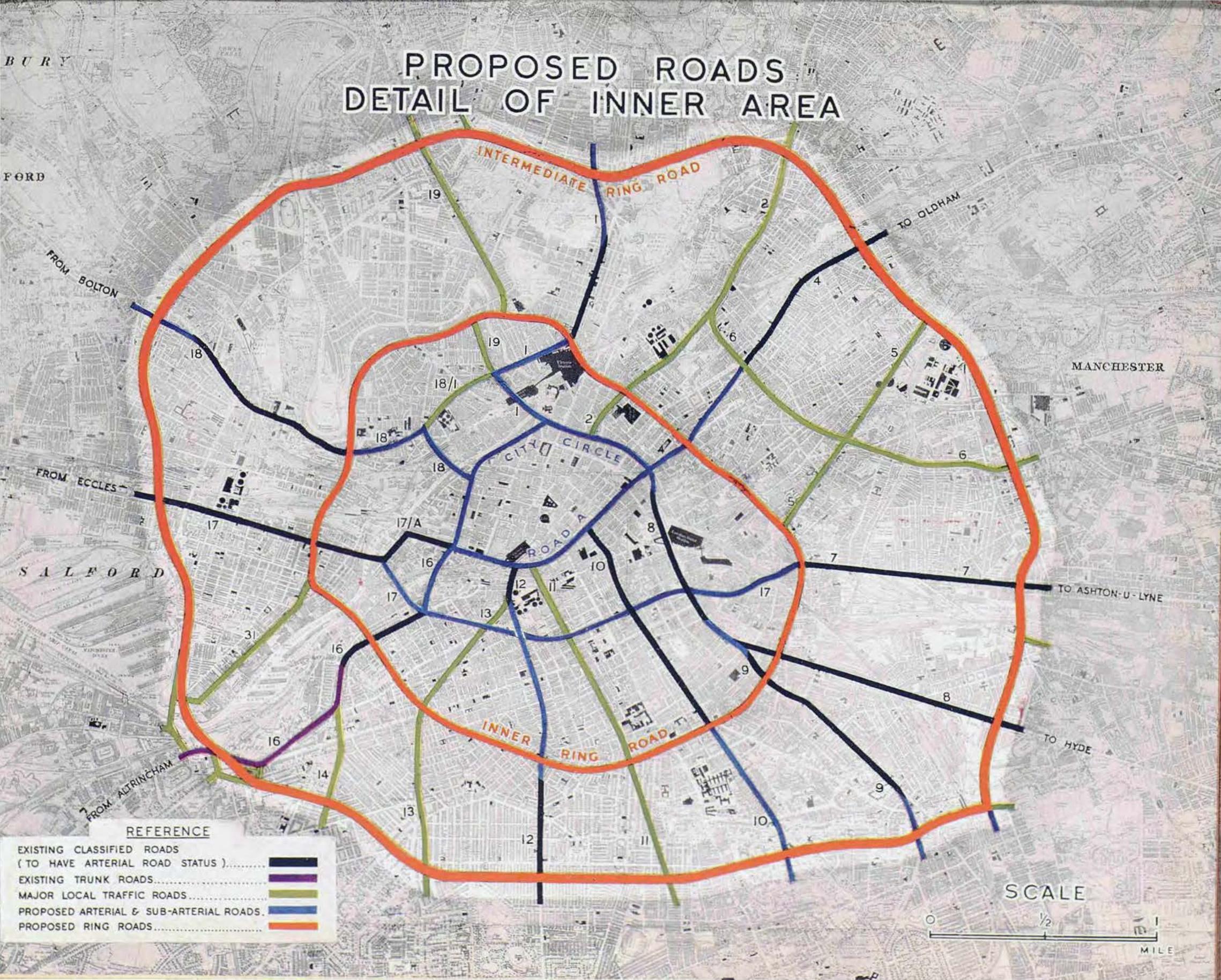
Fig. 21. Relaxation of byelaws in respect of carriageway and footpath widths only. Verges have not been indicated on the diagram.

be satisfied. Planning on a large scale need not necessarily be expensive in the long run—in fact, lack of it must prove more costly. Since in many cases “back land” is comparatively inexpensive, the cost of a major improvement is not greatly in excess of small-scale widenings of the immediate

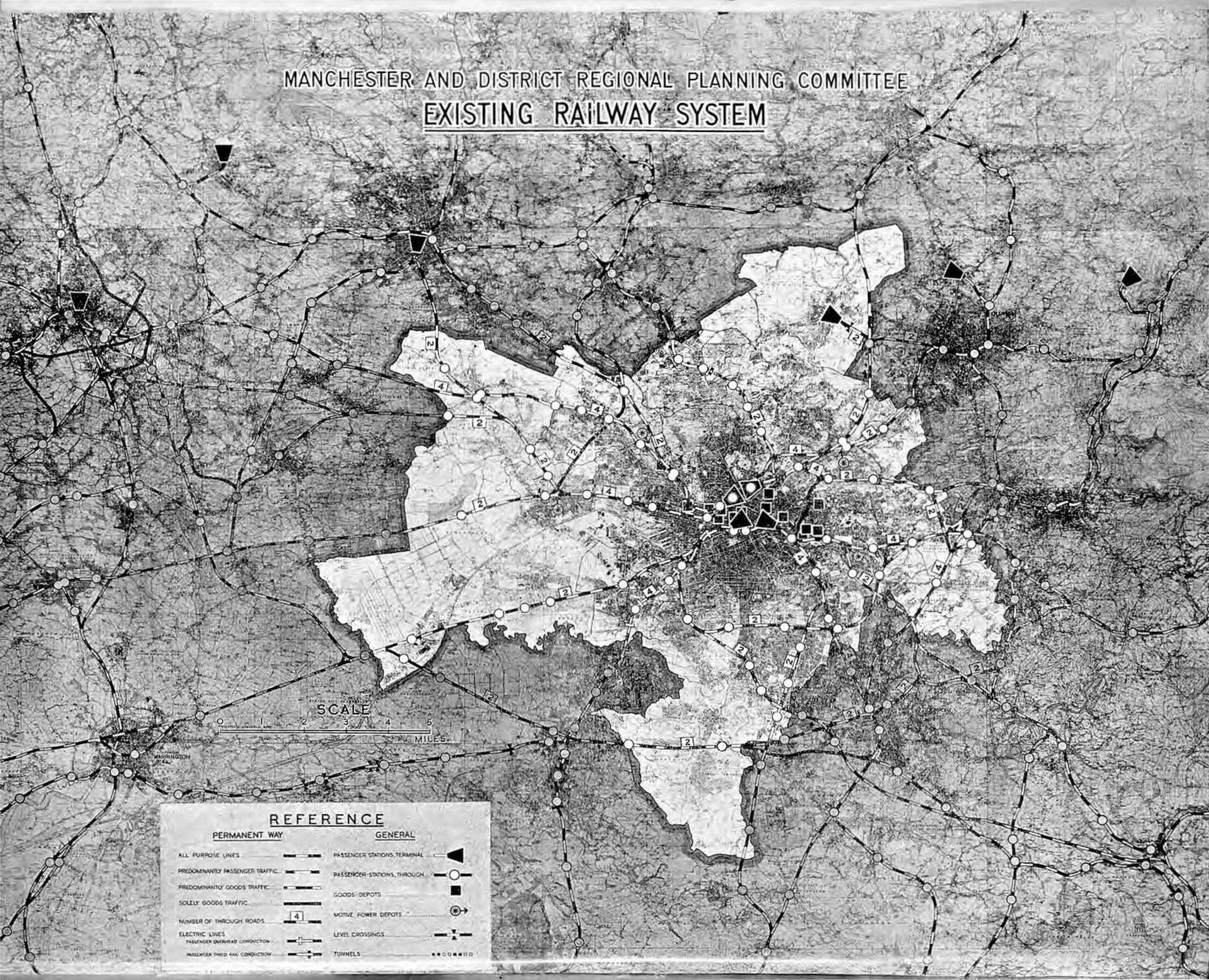
road frontages. The chief costs are those of re-building, disturbance and goodwill. Piecemeal planning must be abandoned; we must break away from the policy of very costly local widenings, which have so often proved to be inadequate within but a short time after their completion. [466]



# PROPOSED ROADS DETAIL OF INNER AREA



MANCHESTER AND DISTRICT REGIONAL PLANNING COMMITTEE  
EXISTING RAILWAY SYSTEM



REFERENCE

PERMANENT WAY	GENERAL
ALL PURPOSE LINES	PASSENGER STATIONS, TERMINAL
PREDOMINANTLY PASSENGER TRAFFIC	PASSENGER STATIONS, THROUGH
PREDOMINANTLY GOODS TRAFFIC	GOODS DEPOTS
SOLELY GOODS TRAFFIC	MOTIVE POWER DEPOTS
NUMBER OF THROUGH ROADS	LEVEL CROSSINGS
4	TUNNELS
ELECTRIC LINES PASSENGER OVERHEAD CONDUCTION	
PASSENGER THIRD RAIL CONDUCTION	

## RAILWAYS

SO COMPLEX is the region's railway network and so numerous its passenger and goods stations (particularly those concentrated in the regional centre) that any reconstruction of the railway undertakings must have a considerable influence on the planning proposals. Consequently, detailed and comprehensive studies have been made of the location of passenger terminals and goods stations, of cross traffic between such stations, and of goods transport problems in the central area, as well as of re-routing, electrification, and tube-railway proposals. [467]

## THE MAIN PASSENGER SYSTEM

The regional centre is served by the following stations:

## (a) Terminals.

Victoria (London, Midland & Scottish Railway)  
Exchange (London, Midland & Scottish Railway)  
Central (Cheshire Lines Committee)  
London Road (London, Midland & Scottish, and London & North Eastern railways)

## (b) Other principal stations.

Salford (London, Midland & Scottish Railway)  
Ordsall Lane, Salford (London, Midland & Scottish Railway)  
Oxford Road (Manchester South Junction & Altrincham Railway)  
Knott Mill (Manchester South Junction & Altrincham Railway)  
Mayfield (London, Midland & Scottish Railway)  
Guide Bridge (London & North Eastern Railway) [468]

Before the war Victoria, London Road and Central stations dealt with approximately 75 per

cent of the morning business traffic into Manchester. Of the four main-line termini only Victoria and Exchange are linked directly for passenger interchange. The lack of rail communication between the stations in the inner area has serious disadvantages, creating cross-city traffic where congestion is already at its worst. [469]

## The Terminals

(a) Victoria Station (L.M.S.) is the largest of the Manchester stations, having 17 platforms. It handles the Blackpool and West Coast holiday traffic and is a terminal for the suburban lines from the north and north-east. It is linked with Exchange Station by the longest platform (731 yards) in the British Isles. The architectural setting of the station is unworthy of a terminal of such importance, especially in view of its proximity to Manchester Cathedral and Chetham's Hospital. It stands on a cramped sloping site off Corporation Street, and road access is at present unsatisfactory. [470]

(b) Exchange Station (L.M.S.) is cut off at the rear from Salford by the railway viaduct approaches to Victoria. It is approached by an incline; the manoeuvring space for vehicular traffic in the forecourt is inadequate. The Salford Corporation's Victoria bus station is quite near and provides intercommunication for road and rail transport. [471]

(c) London Road Station (L.M.S. & L.N.E.), sited to the east of the Manchester city centre, serves the eastern and south-eastern parts of the region, with connections to the East Coast, the Midlands and London. Electrification of suburban lines has been started. The approach is badly sited on a steep incline, joining London Road at its junction with Ducie Street and Auburn Street. The large volume of horse-drawn goods traffic along Ducie Street and public-service vehicles along London Road cause traffic conditions of extreme difficulty. [472]

(d) Central Station (C.L.C.), the most recent of the Manchester terminals, is well sited in relation to the regional centre, but screened by the Midland Hotel. It is a "stub" terminal from which all trains have to be reversed over congested viaduct tracks, and is devoid of any links with Victoria and London Road stations. In consequence, workers in the Trafford Park industrial estate are largely dependent upon road transportation, which gives rise to serious problems of congestion and a heavy peak-hour burden on the bus undertakings. [473]

### Recommendations

In considering the railway facilities required by this important region the following needs must be borne in mind:

- (a) Linkage of main-line and suburban stations to eliminate journeys across the regional centre.
- (b) Separation of suburban and main-line passenger traffic, as far as possible, by diverting city workers from main-line terminals.
- (c) Adequate road access to and from the inner ring roads.
- (d) Close linkage with bus terminals, including pedestrian subways to avoid vehicular traffic.
- (e) Good architectural setting for main stations, especially in relation to other important buildings in their vicinity. The provision of adequate forecourts would help to create a good impression in the minds of visitors arriving at the regional centre.
- (f) A vigorous policy of smoke abatement, entailing the conversion of all lines in the regional area, where practicable, to electric traction.
- (g) The through routing of trains from the north and east of the region to convey workers to and from Trafford Park, and direct platform interchange into those trains at a convenient point for workers arriving from other parts of the region. [474]

None of the existing main stations may be regarded as adequate in its present form. [475]

### The Trinity Station

A possible remedy for most of the deficiencies of the existing railway system is the planning of a new main station (hereafter referred to as the Trinity Station) between the existing Salford and Exchange stations, with main entrances from both the

Manchester and Salford sides (see Fig. 22, opposite). [476]

The provision of such a station would do much to rehabilitate that area between Manchester and Salford which has latterly become so derelict. It might combine the main-line functions of Victoria, Exchange, and Salford stations: by means of a comparatively short length of new viaduct across the River Irwell from the existing Cheshire Lines viaduct between Cornbrook and Castlefield, the functions of Central Station also might well be transferred to it. This would facilitate the through running of trains from Liverpool to Hull and from the Trafford Park industrial estate to the northern, north-western and eastern parts of the region via the Whitefield-Bury line and the Rochdale, Oldham and Stalybridge lines. [477]

Connection with London Road Station might be achieved by a suitable connecting curve from the Ordsall Lane-Castlefield Junction branch of the M. S. J. & A. line through Knott Mill and Oxford Road into the new station. Thus the electric trains from Altrincham via Old Trafford could operate into both Trinity and London Road stations and provide a shuttle service between them. [478]

Under such a scheme Exchange, Salford and Central stations would become redundant, but Victoria Station, with a reduced number of platforms, might advantageously be retained to accommodate the influx of city workers (mainly from the northern and north-eastern parts of the region) to the Corporation Street-Royal Exchange commercial area. [479]

The present inadequate railway buildings at Knott Mill and Oxford Road should be replaced by modern stations to serve the regional centre. These, together with London Road, Victoria and the suggested Trinity Station, are so distributed that all but a small portion of the central area would be within three-eighths of a mile of at least one passenger station. [480]

Trinity Station would be well served by the proposed road system, while provision could be made for car-parking accommodation on both fronts, a bus station serving both Manchester and Salford, and a parcels and mails sorting office with independent road access. [481]

Suburban lines might well be grouped on the Manchester side of the station to permit rapid dispersal of passengers during the rush hours. [482]



Fig. 22. RAILWAY PROPOSALS. The proposed Trinity Station would combine the main-line functions of Victoria, Exchange, Central, and Salford stations. The siting of goods terminals outside the Inner Ring Road would relieve congestion in the regional centre.

## London Road Station

After the development of the Trinity Station proposal, consideration was given to the possibility of a connection with London Road Station so that all the long-distance railway facilities could be concentrated at Trinity Station, with London Road Station retained for local passenger traffic. This connection could be effected by the construction of a link from the present viaduct at Fairfield Street, passing in an arc near New Cross, north of the city centre, and rejoining the existing line in Victoria Station. The work would involve tunnelling from a point near Port Street to New Mount Street; it would also be necessary to re-grade existing rail levels in the vicinity of Victoria Station and to make substantial alterations in road levels. The relative positions of rail and road would actually have to be reversed at the Cheetham Hill Road bridge. [483]

There has not yet been time to work this scheme out in further detail. It will, however, be fully investigated if, as a result of conversations with the railway companies concerned, it should be regarded as a practical proposition. [484]

If it is found that London Road Station must be retained for main-line services it could, with advantage, be sited nearer the city centre with a spacious forecourt fronting on to the proposed Portland Street extension and flanked by London Road and the Inner Ring Road. The ground levels are favourable for the incorporation of a basement parcels and mails station, with vehicular access unimpeded by the taxis and private cars using the station approaches. Subways could give safe passage under the traffic streams on Portland Street extension and provide access to the regional shopping centre, the retail market and Piccadilly Gardens. [485]

The functions of Mayfield Station could be transferred to the rebuilt main station, the site being of adequate dimensions to afford the requisite facilities. [486]

## THE GOODS PROBLEM

Some five and a half years of intensive productive effort for wartime purposes have once more demonstrated the capacity of the railway system to serve industry. The railways are indispensable for goods transportation in bulk over

long distances; they must play a large part in post-war industrial reconstruction and in the maintenance of export trade. [487]

As in the case of the passenger stations, there are no rail connections between the many goods stations in the regional centre (see Plate 22, facing page 95). There are seven goods terminals within the area bounded by the Inner Ring Road, namely: Ancoats, Central, Deansgate, Liverpool Road, London Road, and (in Salford) the Irwell Street and New Bailey yards. Just outside the Inner Ring Road are the Ardwick, Ardwick East and Oldham Road goods stations. In addition there are five other goods stations within the city boundaries of Manchester alone. [488]

No specific delivery areas appear to be allocated to the ten inner terminals; each serves the whole area with sundries traffic originating from or destined for the geographical regions served by its respective section of the main-line system. The pre-war volume of goods traffic taxed the full capacity of the terminal accommodation. Reorganisation proposals which are now being considered by the railway companies may afford some relief in respect of the inter-terminal transfer of goods not specifically destined to or despatched from the central area. [489]

The daily cartage of goods through the city streets from one rail network to another, largely by heavy horse-drawn vehicles, has been estimated at 400 tons. [490]

The major planning problem, obviously, is to reduce street congestion in the inner area as far as is practicable. It is appreciated, however, that the transport of goods is at least as important as the convenient movement of private cars and buses. [491]

It is essential that there should be good rail connections to the markets serving the region. Before the war a large volume of fruit, flowers and vegetables had to be double-handled on to road transport traversing the inner area to Smithfield Market. Manchester's abattoir and wholesale meat market in Water Street are unconnected by rail (the Ordsall-Knott Mill line crosses the site on a viaduct) and are two and a half miles from the cattle market at Trafford Park. [492]

A redistribution of goods facilities, the collection into special zones of many indiscriminately located industrial units, and the concentration of warehouses into defined belts, are all desirable

objects to be considered in the preparation of planning proposals. The need for the concentration of industry in zones furnished with rail access is evident; true economy must lie in the through running of full wagon loads to the consignee's premises.

[493]

### Re-siting of Goods Terminals

To reduce inter-terminal road transport, and also to enable the central area and the industrial and warehouse zones to be efficiently served for delivery and collection, it is suggested that the terminal facilities should ultimately be transferred to sites outside the Inner Ring Road, along which traffic could circulate from one to another and so relieve congestion in the centre.

[494]

Goods stations do not readily lend themselves to compact site planning; they require ample shunting space, which could be more suitably provided in the area between the Inner and Intermediate ring roads. This arrangement would also make it possible to separate the functions of goods and passenger terminals, and to free the converging rail approaches to the latter for the expeditious handling of passenger-train movements.

[495]

In the interests of good planning it is suggested that there be two main goods terminals (see Fig. 22, page 97):

- (a) The western, or Windsor goods terminal.
- (b) The eastern, or Ardwick goods terminal.

[496]

The Oldham Road Station, being outside the Inner Ring Road, could be retained to give direct rail service to a re-sited Smithfield wholesale market.

[497]

The suggested Windsor terminal would have good road access from the Inner and Intermediate ring roads and the radial roads flanking it. A direct rail link with the suggested easterly terminal would be available in the Ordsall Lane to Knott Mill and London Road line of the M. S. J. & A. Railway. The site already accommodates a group of goods yards and cattle sidings.

[498]

The Ardwick goods terminal could be formed by combining the existing group of goods yards at Ardwick into a single unit, with an ultimate extension to absorb the functions of the Ducie Street and Ancoats stations.

[499]

The area outside the Inner Ring Road could be divided into sections, each with its own sorting-

depot for locally based distributing services. Between these sub-depots and the appropriate main terminal, pre-sorted goods could be conveyed in bulk by large-capacity motor vehicles, which would thus reduce the number of cartage units on the road and simplify the work at the main terminals.

[500]

The re-siting and modernisation of the passenger and goods terminals must entail engineering problems of considerable magnitude. Nevertheless, if the community's needs are to be adequately met, such a reconditioning of the railway system must be envisaged in the planning proposals.

[501]

### SUBURBAN ELECTRIFICATION

The electrification of surface railways to accelerate the handling of suburban passenger traffic was started in the Manchester region in 1915 with the conversion of the Manchester (Victoria) to Bury (via Whitefield) line on the third rail system. (An experimental section between Bury and Holcombe Brook had been electrified in 1913-1914.) This line carries a heavy suburban service with trains at five-minute intervals during rush hours and every 20 minutes during the day.

[502]

The London Road (Manchester) to Altrincham line was converted in 1931 to electric traction by the Weir system, which involves the erection of standards and overhead conductors. This improvement was followed by extensive residential developments in the vicinity, and two additional stations were built to serve the areas between Old Trafford and Stretford and between Stretford and Sale.

[503]

At the outbreak of war, work had already begun on the electrification of the Manchester (London Road) to Sheffield line (L.N.E.R.) via Woodhead Tunnel. This scheme, the completion of which had to be postponed until the end of the war, provides also for the electrification of the branch line from Guide Bridge Junction through Chorlton to the Trafford Park sidings.

[504]

Whether or not all main lines are ultimately electrified, the handling of suburban and regional passenger traffic would be greatly expedited, and much smoke pollution obviated, by the general electrification of all lines within the regional planning area. It would permit a more intense usage of passenger platforms at terminal stations, eliminate the switching of engines from end to end of trains, make possible more rapid acceleration

and less headway between trains, ensure quicker time-schedules in rush-hour periods and enable a number of additional suburban stations to be introduced to satisfy ultimate residential requirements. Electrical haulage in the goods terminals and marshalling yards would contribute substantially towards the alleviation of the smoke nuisance. [505]

The Trafford Park industrial estate, which provides employment for some 76,000 people, is indifferently served by rail for passenger transport. Old Trafford Station on the M. S. J. & A. line is approximately half a mile from the eastern entrance of the estate, at Trafford Park Road. Trafford Park Station, on the main line from Central Station to Warrington and Liverpool, adjoins the Taylor's Bridge entrance to the estate from Moss Road, Stretford, across the Bridgewater Canal. The service it provides, however, is limited by the lack of road communications from this point into other parts of the estate. The removal of this station further west to Moseley Road, and the enlargement of the Manchester United Football Ground station at Warwick Road North, would greatly improve passenger access to the estate. [506]

Elsewhere in the region new stations might be constructed at:

- (a) Stretford, on the Manchester (Central) to Liverpool line at the point where it crosses Derbyshire Lane and Winchester Road.
- (b) Eccles, to the west of New Lane on the main L.M.S. Liverpool to Manchester line, to serve an area to be developed for residential purposes.
- (c) Middleton, near Slattocks on the Rochdale L.M.S. line. A new station at this point would serve the proposed industrial estate. The existing terminal station at Middleton is on a branch of the L.M.S. line to Rochdale, and passengers to and from Manchester have in many instances to change trains at Middleton Junction. A substantial increase in Middleton's population must be anticipated and a more frequent railway service provided, particularly in rush-hour periods, if the railway is to serve adequately the needs of the district. [507]

The development of Wythenshawe by the Manchester Corporation raises the question of rail transport into North Cheshire (where at least

part of the regional "overspill" must be rehoused). [508]

Wythenshawe, with an ultimate population of 80,000, is traversed only by an east-to-west line used predominantly for freight trains and without radial connection to the regional centre. The Styal branch line from London Road Station passes along the eastern boundary of the estate, with Gatley and Heald Green stations at distances of  $1\frac{1}{2}$  and 2 miles respectively east of Princess Parkway. Passenger transport to and from the city centre is at present provided by bus services, few of which pass near either station. A local rearrangement of bus routes would enable these two stations to serve Wythenshawe and so reduce the large numbers of buses now running all the way to the city. The rail approaches, however, to London Road Station are so congested, under the existing system of steam haulage, that effective use of the Styal line for increased train services to and from Wythenshawe will be impossible until the route is electrified and London Road Station reconstructed or at least enlarged. [509]

Connecting curves might also be introduced to link the existing line through Baguley and Northenden stations with the Styal line, and with the Altrincham line near Timperley. A greater use of the latter line would necessitate the provision of additional tracks south of Sale station and north of Warwick Road. [510]

## UNDERGROUND RAILWAYS

As long ago as 1902 proposals were being considered for the construction of a tube railway system in Manchester. In that year a Bill (subsequently abandoned) was deposited asking Parliament for powers to construct a system of deep-level tubes named "The Manchester City Circle Railway". Since that date the question has been raised on many occasions. [511]

Reporting to a special committee on the passenger transport problem of Manchester in February, 1914, the then Transport Manager set out certain main conclusions, of which the following still have considerable force in the light of present-day traffic considerations:

- (a) That, in planning underground lines for rapid transit, the aim should be to supplement the surface transit lines; that the rapid-transit lines should be laid so as to follow as closely as possible the direction of flow of

the greatest volume of traffic; and the surface lines should be adapted so as to act as feeders to the rapid-transit lines at all convenient points.

(b) That, on account of the great initial cost, the construction of underground rapid-transit lines cannot be justified, unless there is a very large volume of traffic to be dealt with . . . Underground lines, if they are to be placed on a paying basis, must be worked by high-speed trains operated at a very close headway. This demands a great density of traffic. [512]

In July, 1936, a joint conference took place of members of the Manchester Underground Railway Committee, the Manchester and District Joint Town Planning Advisory Committee, the London, Midland & Scottish Railway Company and the London & North Eastern Railway Company. The original object of the meeting was to consider the practicability of an underground railway for Manchester in one of two forms:

- (1) A system of tubes with stations in or near the railway stations.
- (2) The connecting of the railway systems by underground to enable railway rolling-stock to run through Manchester. [513]

It was agreed in advance that before proposals for underground railways were examined the following points should be discussed:

- (1) The need, in view of existing transport conditions, for passenger transport co-ordination.
- (2) The area to which a scheme of co-ordination should apply.
- (3) The best means of preparing a draft scheme of co-ordination. [514]

No definite conclusions were reached and at a later meeting of representatives of local authorities, railway companies and private operators, in April, 1937, the following resolution was adopted:

That this meeting is not in favour of proceeding further at the present time to investigate the desirability of constituting a joint transport authority for South-East Lancashire and East Cheshire. [515]

The Manchester City Council has recently considered proposals for underground linkage between the existing surface routes. These proposals could not be regarded in the same light as a "tube railway system", although improved rail access would be provided in the central area. [516]

The cost of these underground links would not be proportionate to any advantages they would offer, as their construction would bring little economy

so far as surface planning is concerned. In 1939, buses formed some 18 per cent of the traffic on the roads in the central area, but whereas commercial vehicles and particularly private cars may be expected to increase twofold during the next 25 years it is not anticipated that bus traffic will show so big an increase. In fact, it is estimated that bus traffic will only form some 10 per cent of the total traffic at the end of that time. Thus, even if an underground rail system were installed it would still be necessary to carry out a vast road-replanning scheme. Moreover, the planning proposals envisage a dispersal of population and industry, and as this is effected the peak-hour strain on the suburban transport system will be to some extent eased. If tubes were not regarded as an economic proposition at the time when there was a maximum concentration of population, they will be even less justifiable when the redevelopment plan has been carried out. The proposals outlined in this chapter (see Fig. 22, page 97) for the reconstruction of the existing railway system take the fullest advantage of the existing railway layout; they enable the linkage which a tube system might provide to be accomplished at less cost by the use of surface lines. [517]

## CANALS

The region is served by the following canals (Fig. 23, page 102):

The Manchester Ship Canal  
The Bridgewater Canal  
The Rochdale Canal  
The Ashton Canal

The Manchester, Bolton and Bury Canal [518]

(a) The Manchester Ship Canal, opened for through traffic on January 1st, 1894, cost approximately £15,000,000 to build. Financial difficulties were encountered during the course of construction and the aid of the Manchester Corporation was enlisted. The City Council now appoints 11 of the 21 directors on the Board. The annual value of merchandise carried over the canal has reached well over £100,000,000. [519]

On the occasion of the formal opening of the canal Queen Victoria said:

... I recognise in this great and important undertaking and the admirable engineering skill with which it has been constructed, further evidence of the increasing energy and enterprise of my subjects. I trust that the increased facilities

to be afforded by it for direct commercial intercourse by sea with the trade of the world will not fail to be of the greatest advantage to the busy and industrious population of Manchester and the neighbouring district . . .

The construction of the canal has had a marked effect on the industrial and commercial development of the region, and has fully borne out the hope expressed by Her Majesty. [520]

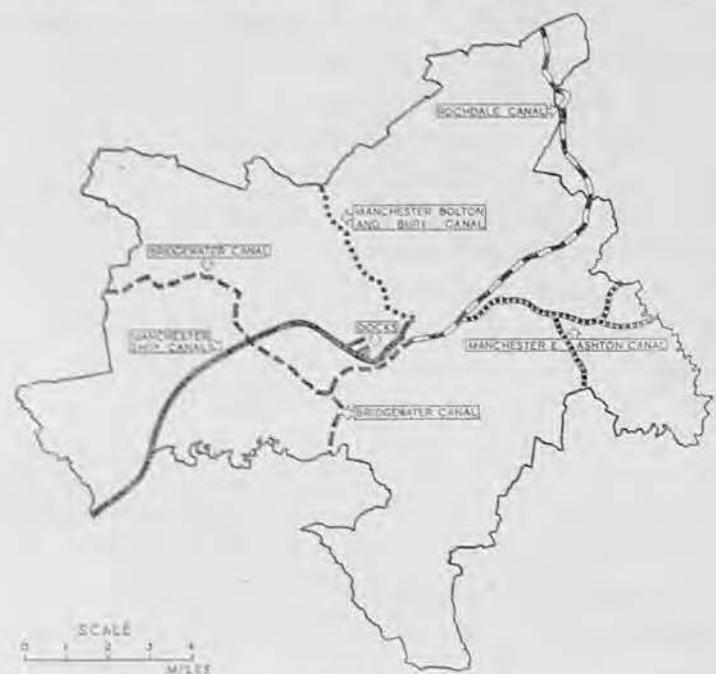


Fig. 23. Canals in the region.

The canal in the regional area has a depth of 28 feet and a maximum bottom width of 170 feet. It is formed from canalised sections of the Rivers Mersey and Irwell. The water level at the eastern terminus of the canal is some 70 feet above mean sea-level. [521]

(b) The Bridgewater Canal, constructed in 1773 for the Duke of Bridgewater, is owned and operated by the Manchester Ship Canal Company. It is maintained in good condition, serves the Trafford Park industrial estate and carries a considerable amount of traffic (approximately 400,000 tons in 1939). Through the River Weaver Navigation and the Shropshire Union Canal, the Bridgewater Canal connects the Ship Canal with virtually all the inland navigation systems in the country. It has an average width of 45 feet, with a depth of five feet six inches, and can accommodate barges of 60-70 tons capacity and 70 feet in length. It is maintained at one level (no locks) in the regional area. Feed water is provided by the River Medlock and the Rochdale Canal. [522]

In the latter half of the eighteenth century the Duke of Bridgewater commenced the construction of an underground canal system at Worsley to eliminate the double-handling of coal from the colliery workings. By this method coal was conveyed direct from the workings to Manchester at a considerable saving in cost. The price of coal was in fact reduced from 7d. to 3½d. per cwt. This canal system, opening on to a basin at Worsley, comprises some 33 miles of underground waterways. Entrances to the underground workings are shown on Plate 23, facing this page. [523]

(c) The Rochdale Canal runs from the Castlefield wharves to Rochdale and eventually links up with the Calder and Hebble Navigation at Sowerby Bridge. The number of locks and the reduction, in parts, of the effective draught by subsidence and silting make it uneconomic to operate. With the exception of the length from Castlefield to the junction with the Ashton Canal, it has ceased to be used for navigational purposes, but it provides feed water for the Bridgewater Canal. [524]

(d) The Ashton Canal connects the Rochdale Canal at Manchester with the Huddersfield Canal at Ashton, and has two branches, one from Fairfield to Hollinwood, the other from Clayton to Stockport. These branches are navigable only in part. The canal does not carry much traffic. [525]

(e) The Manchester, Bolton and Bury Canal is owned by the L. M. & S. Railway Company. The main section is from Manchester to Bolton, with a branch, navigable only by small boats, serving Bury. Parts are disused and no through traffic can be carried, but use is made of the sections adjoining the terminals. [526]

The Manchester Ship Canal and Bridgewater Canal form an integral part of the industrial structure and contribute substantially to the prosperity of the region. In view of the increasing use of road haulage, however, it is not anticipated that the remaining canals in the region will carry much merchandise. [527]

Disused sections of canals must be carefully considered from the planning standpoint, especially in relation to their possible amenity value. The photographs of the Bridgewater Canal at Worsley on Plate 23, facing this page, indicate the need for preserving pleasant walks along canal banks. A long-term planning policy should, however,



1



2

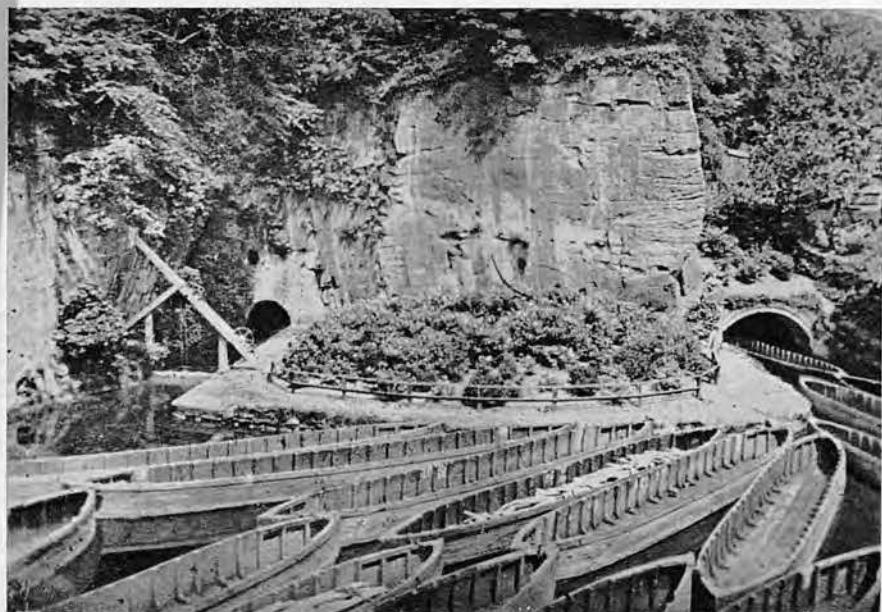
## CANALS

1, 2 and 3. Views of the Bridgewater Canal at Worsley

This canal is maintained in good condition and carries a considerable amount of traffic. It was constructed in 1773 for the Duke of Bridgewater.



3



4

4. Entrances to the underground canal system at Worsley

There are some 33 miles of underground waterways. Their construction was commenced in the latter half of the eighteenth century to eliminate the double handling of coal from the colliery workings.



1. A view of the Port of Manchester



2 & 3. Barton (Road and Canal) Bridges over the Manchester Ship Canal

provide for the elimination of any canals in the region which have no amenity value and which are no longer required for navigational or feeder purposes. 528

528

## DOCKS

The docks at Salford, Stretford and Manchester, more familiarly known as the Port of Manchester, form the eastern terminus of the Manchester Ship Canal, and have been one of the most important factors in the industrial prosperity of the region. In terms of goods handled the port ranks as the fifth in the United Kingdom. [529]

The docks at Salford can accommodate ocean-going vessels of 15,000 tons. The Pomona Docks at Stretford and Manchester can accommodate

smaller ocean-going vessels and coasters up to 1,000 tons. The quays total more than  $5\frac{1}{2}$  miles in length and the port equipment includes plant of the most modern types. There are excellent railway facilities and the docks are connected with virtually the whole of the canal system of the country. [530]

Adequate and well-planned road access and ample warehousing accommodation are essential to the prosperity of the dock undertaking. An improvement in the road system to facilitate the rapid movement of goods is proposed in the form of the Intermediate Ring Road, running to the east of the docks. With a view to the possible increase in export trade after the war, land must be reserved for dock purposes and for further warehousing accommodation. [531]

[531]

## AIRPORTS

The Manchester region, with its vast industrial, commercial and business interests, must have a major airport, conveniently sited. Physical conditions preclude its provision wholly within the regional area, but the City of Manchester Airports Committee is considering the reservation of additional land at Ringway for this purpose. [532]

Air transport facilities have been in existence in the region since 1930, when Barton Airport in Eccles was opened. Later, it was decided that this was inadequate for a major airport and a site of larger dimensions was selected at Ringway. The progressive development of this airport was planned in 1934, in the light of the most up-to-date aeronautical knowledge available at that time. It lies in the green belt to the south of the region, on the watershed of the Rivers Mersey and Bollin. This slightly elevated situation simplifies the problem of height zoning for surrounding buildings. There are no natural obstructions to the north, south and west, but to the east, some 10 to 15 miles away, is the high ground of the Pennines rising to

103



Fig. 24. Diagram illustrating the geographical importance of the Port of Manchester, which is the nearest port serving the towns within the area enclosed by the dotted lines.

approximately 1,800 feet above the level of the airport. However, even under the most difficult flying conditions, with radio guidance, no difficulties of approach from this direction will be experienced. [533]

Road access from the regional centre will be by way of the proposed extension of Princess Parkway, planned as part of the Wythenshawe estate development. This will enable the airport to be reached by car from the centre of Manchester in approximately 15 minutes. The Outer Ring Road will facilitate communication with other parts of the region. [534]

When Ringway is fully developed it should take its place as a major airport in a co-ordinated scheme for civil air transport, with services to the main European cities. [535]

The area available and suitable for airport purposes at Ringway can be extended to a limit of about 1,355 acres—sufficient to accommodate a

transcontinental airport with a main runway of 3,200 yards and subsidiary runways of 2,700 yards in length. From an airport of this type, aircraft with a range of up to 1,600 miles could fly direct to Leningrad, Moscow, Bucharest, and towns in North Africa from which the Atlantic could be crossed by the southern route. If future developments show it to be desirable it would, in fact, be possible to accommodate an intercontinental type of airport from which aircraft could operate with a range of up to 3,000 miles. The reservation of land for this purpose must be carefully considered. [536]

The South Lancashire and North Cheshire Advisory Planning Committee is considering the reservation of sites for local airports within its area, so that as the need arises they may be immediately available for development. These airports would be used mainly for traffic within this country and for connection with the long-distance services to and from Ringway. [537]

WITHIN THE REGIONAL AREA there are 12 statutory authorities for main drainage and sewage disposal, five for the supply of electricity (excluding bulk supply undertakers), seven for the supply of water and nine for the supply of gas. [538]

Planning—especially if related to a “time” schedule—will enable supply undertakings to assess future demands more accurately. [539]

It would appear at first sight that a vast regional redevelopment programme with a consequent dispersal of population would have a serious effect on the supply services. In regard to the consumption of water, however, a rising standard of living and a universal provision of baths would go a long way to balance the effects of such a dispersal. Similarly, the pursuance of a vigorous smoke-abatement policy and a demand for labour-saving devices will increase the consumption of gas and electricity. [540]

### DRAINAGE

The 12 sewage-disposal authorities within the region control 20 works (see Fig. 25). The works range in size from Davyhulme, which serves a population of 818,000, to Worsley Road, serving a population of 1,578. [541]

The drainage authorities in the region are:

Manchester C.B.	Denton U.D.
Salford C.B.	Failsworth U.D.
Eccles M.B.	Irlam U.D.
Prestwich M.B.	Urmston U.D.
Stretford M.B.	Worsley U.D.
Swinton & Pendlebury M.B.	Stalybridge & Dukinfield Joint Board [542]

For some time consideration has been given to the regional treatment of sewage. In September, 1936, a conference was held between representatives of the Rivers Mersey and Irwell Joint Committee and the (then) Manchester and District Joint Town Planning Advisory Committee. [543]

The case for regionalisation was stated as follows:

Much could be written in regard to the desirability of joint action in this matter, and the most important fact is that the disposal of sewage should be determined by the physical characteristics of the areas, and not, as is usually the case, by the artificial boundaries of districts for administrative purposes. Where, therefore, joint action is both economic and efficient, the disposal of sewage should be dealt with at a common outfall and not at a separate outfall for each district.

The chief advantages of this policy have been summarised by the Ministry of Health as follows:

- (1) Greater efficiency in the system of sewage treatment and in the management of works.
- (2) Economy in working costs and in administrative expenses.
- (3) Reduction of the possibility of nuisance or of pollution of rivers.
- (4) Reduction of the automatic restriction on building development which sewage-disposal works tend to impose. [544]

It may be presumed that a strong case exists for the regionalisation of sewage disposal in and around the regional area. Consideration of such a proposal, however, would entail much detailed investigation and survey work before definite proposals could be formulated. [545]

Table 1 sets out statistics—prepared in 1938—relating to the sewage works in the region. [546]

### ELECTRICITY

The regional area contains two generating stations (Barton and Agecroft) selected under the North-West of England supply scheme of the Central Electricity Board. On the fringe of the area are similar selected stations at Chadderton, Hartshead and Stockport. These stations are connected to the 132,000-volt distributing grid network. [547]

The five supply undertakings in the region (see Fig. 26) are:

- The Manchester Corporation
- The Salford Corporation
- The Stretford and District Electricity Board
- The Lancashire Electric Power Company
- The Oldham Corporation (supplying only a small part of Middleton) [548]



REFERENCE

- SEWAGE DISPOSAL WORKS
- ▲ STORM WATER TREATMENT ONLY

- AREA DRAINED TO LOCAL AUTHORITY'S OWN SEWAGE WORKS
- " " MANCHESTER CORPORATION SEWAGE WORKS
- " " SALE CORPORATION SEWAGE WORKS
- " " STALYBRIDGE & DUKINFIELD SEWAGE WORKS

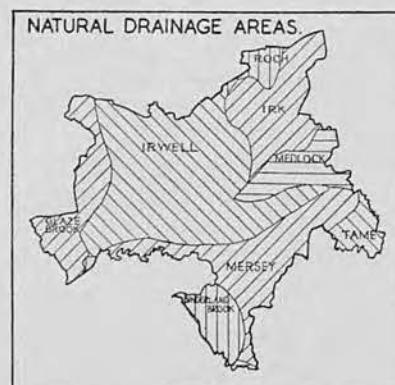


Fig. 25. MAIN DRAINAGE—Sewage disposal works and natural drainage areas.

Table 1 SEWAGE DISPOSAL WORKS—MANCHESTER REGION  
(Statistics prepared in 1938)

<i>Watershed</i>	<i>Local authority</i>	<i>Name of works</i>	<i>Population dealt with</i>	<i>Population capable of being dealt with</i>	<i>Dry-weather flow (galls. per day)</i>	<i>Maximum dry-weather flows capable of being taken (galls. per day)</i>	<i>Method of treatment</i>
Glazebrook	Irlam	Irlam	14,700	—	600,000	650,000	Activated sludge
Glazebrook	Worsley	Boothstown	2,119	10% increase	47,300	50,000	Precipitation tanks, filters and humus tanks
Irwell	Urmston	Flixton	24,200	20,000	720,000	600,000	Detritus tanks, settling tanks, percolating filters and humus tanks
Irwell	Manchester	Davyhulme	813,000	813,000	40,000,000	40,000,000	Detritus tanks, sedimentation tanks. Activated sludge treatment 55%, contact beds 45%
Irwell	Eccles	Eccles	42,400	56,000	2,350,000	2,850,000	Sedimentation tanks, percolating filters, humus tanks
Irwell	Worsley	Barton Old Hall	13,300	10% increase approx.	835,150	900,000	Precipitation tanks and land treatment
Irwell	Worsley	Ellenbrook	6,730	„	149,600	200,000	Precipitation tanks, filters and humus tanks
Irwell	Worsley	Worsley Rd.	1,578	„	35,000	40,000	Septic tanks and filters
Irwell	Prestwich	Prestwich	24,400	—	1,400,000	—	Detritus tanks, percolating filters, humus tanks
Irwell	Swinton and Pendlebury	Slack Brook (Pendlebury)	6,400	—	200,000	—	—
Irwell	Swinton and Pendlebury	Swinton	32,000	50,000	1,150,000	1,560,000	Sedimentation tanks, percolating filters, humus tanks and final filters
Irwell	Swinton and Pendlebury	Coppice Clough	2,275	10% increase approx.	60,000	—	—
Irwell	Salford	Salford	201,800	201,800	12,000,000	12,000,000	Detritus tanks, chemical precipitation, percolation filters and humus tanks
Irk Medlock	Manchester	Middleton	—	—	—	—	Storm water treatment only
	Failsworth	Failsworth	17,370	17,370	1,000,000	1,000,000	Precipitation, percolating filters, humus tanks
Tame	Denton	Denton	21,000	22,000	730,000	839,000	Chemical precipitation and percolating filters
Mersey	Manchester	Moss Side	—	—	—	—	Storm water only. (Now disused)
Mersey	Manchester	Withington	47,000	47,000	1,600,000	1,600,000	Detritus tanks, sedimentation tanks. Activated sludge treatment 55%, contact beds 45%
Mersey	Manchester	Northenden	—	—	—	—	At present operating as a disposal works, but to be abolished at some future date
Mersey	Stretford	Stretford	38,000	39,000	1,680,000	1,730,000	Detritus tanks, sedimentation tanks (pumped), and broad irrigation



Fig. 26. ELECTRICITY SUPPLY UNDERTAKINGS.



Fig. 27. WATER SUPPLY UNDERTAKINGS.

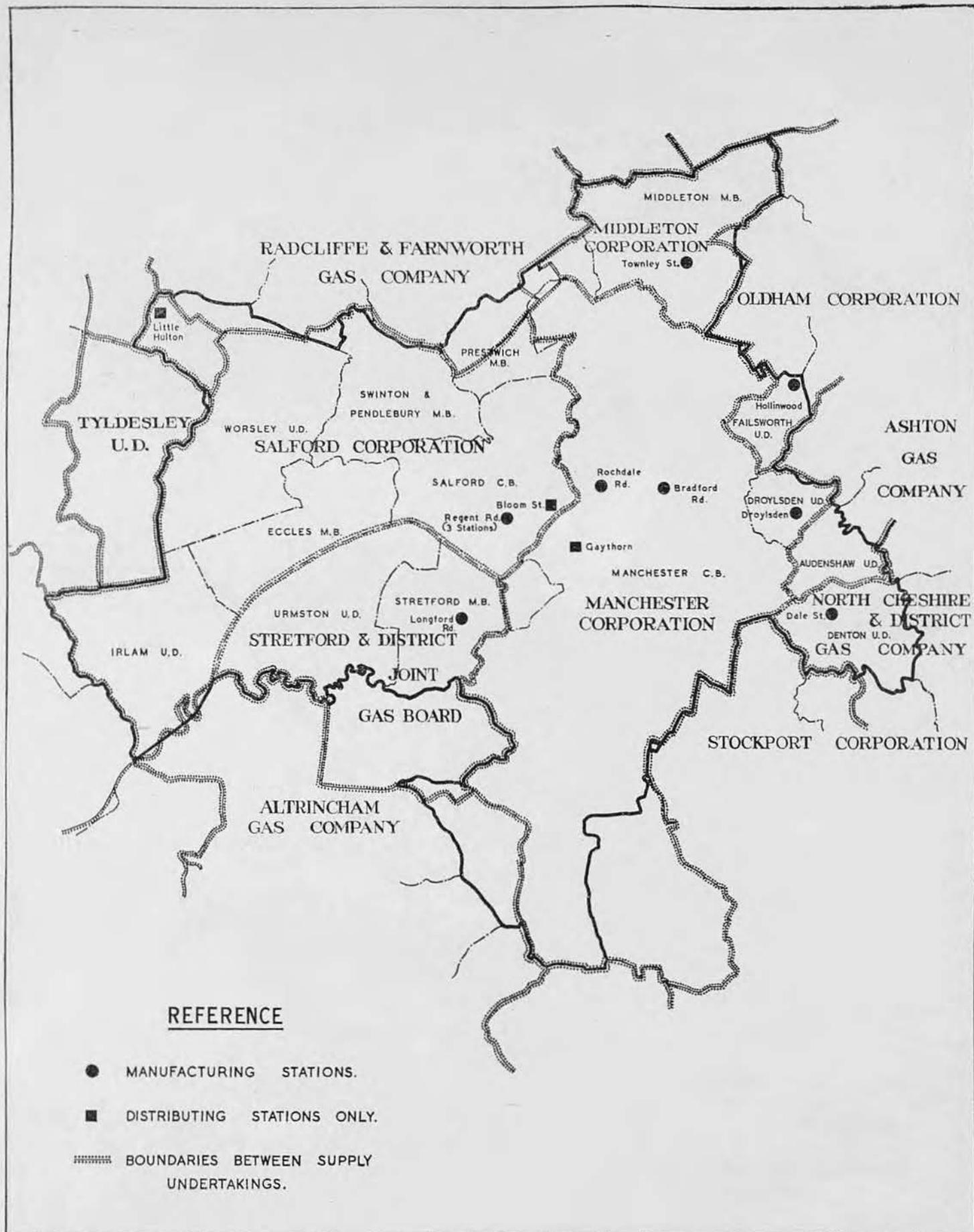


Fig. 28. GAS SUPPLY UNDERTAKINGS.

## **WATER**

Water undertakings supplying the region (see Fig. 27) are:

- The Manchester Corporation
- The Bolton Corporation
- The Heywood and Middleton Joint Board
- The Oldham Corporation
- The Ashton, Stalybridge and Dukinfield Joint Board
- The Stockport Corporation
- The Bury and District Joint Water Board [549]

The Manchester Corporation water undertaking is the largest bulk-supply authority and the second largest water undertaking in the country. It supplies water in bulk to 21 authorities (who are each responsible for distribution) and two waterworks companies, and supplies 26 districts in addition to the cities of Manchester and Salford. [550]

Manchester is one of five cities in the country having a public power water supply available to industrial and other consumers. Approximately 34 miles of mains have been laid (varying in size from three inches to seven inches) providing a supply at a pressure of 1,000 lbs. per square inch. [551]

## **GAS**

Gas undertakings supplying the region (see Fig. 28) are:

- The Manchester Corporation
- The Salford Corporation
- The Stretford and District Joint Gas Board
- The Middleton Corporation
- The Oldham Corporation
- The Ashton Gas Company
- The North Cheshire and District Gas Company
- The Worsley U.D.C. (supply obtained in bulk)
- The Altrincham Gas Company [552]

STONE SPINDLE WHORLS found on Kersal Moor, Salford, indicate that spinning and weaving were carried on in the Manchester region during the New Stone Age. Primitive boats of the Bronze Age have been discovered at Irlam and Barton. [553]

The Celts established a fort at Manchester in the year 38 B.C., and called it Mancenion or "the place of tents". Later, the Romans in their drive northward occupied the settlement and renamed it Mancunium. A few relics of the Roman period still remain, including part of the Roman wall near Knott Mill. The Borough of Stretford derives its name from the Roman road, Watling Street, on which it stands. [554]

Not much is known about the growth of the townships of Manchester and Salford until the thirteenth century. Salford then consisted of the triangular piece of land bounded by Chapel Street, Greengate and Gravel Lane, with access to Manchester by ford and bridge across the River Irwell. Manchester was quite a small town, surrounded by hamlets such as Ancoats, Ardwick and Crumpsall. [555]

Salford received its charter in the year 1230, and Manchester in 1301; both were then essentially market towns. Flemish workers settled in the region in the fourteenth century, and the cotton industry was established in the late fifteenth and early sixteenth centuries. In the year 1536, Manchester was described as "the fairest, best builded, quikkest and most populous toun in all Lancashire". [556]

From then on industrial progress was rapid, aided by an era of mechanical invention which saw the introduction of the spinning jenny, the steam engine and the power loom, the commencement of the canal system and the exploitation of the natural coal resources of the region. [557]

The construction of the Manchester-Liverpool railway in 1830 (the first railway for both goods and passengers) greatly facilitated trade. With the opening of the Ship Canal in 1894 the region became one of the world's chief commercial and industrial centres. [558]

The region is associated with many prominent figures in politics and arts. Earl Lloyd George and Richard Cobden both lived in Manchester, while the Free Trade Hall (severely damaged by enemy action) owed its origin to the struggle for the repeal of the Corn Laws in the early nineteenth century. John Dalton, the eminent scientist, conducted much of his research work in Manchester. Other famous residents were Mrs. Gaskell the authoress and Thomas De Quincey the essayist. The Princes Tavern, the reputed birthplace of De Quincey, stood at the corner of John Dalton Street and Cross Street. [559]

#### Buildings of Architectural or Historic Interest

Although the region has many links with the past, few of the older surviving buildings, except perhaps in Manchester, are of anything but domestic architectural interest. [560]

With the passing of the Town and Country Planning Act, 1944, the Minister of Town and Country Planning has power to compile lists of buildings of special architectural or historic interest, but before doing so he must consult such persons or bodies of persons as appear to him appropriate as having special knowledge of, or interest in, such buildings (Section 42). Copies of such lists when compiled must be deposited with the local authority and notices served on the owners and occupiers of buildings included therein. Section 43 of the same Act considerably strengthens Section 17 of the Town and Country Planning Act, 1932, which gave local authorities power to make orders directing that buildings of architectural and historic interest should not be demolished without their consent. Alterations and extensions to such buildings can now be prohibited if they would seriously injure their character. Power is also given to local authorities with the consent of the Minister to acquire by agreement, or compulsorily, any such building, and also adjoining land if required for maintaining the building, for providing access to it, or for the proper control and management thereof. [561]

Lancashire is rich in domestic architecture of the fifteenth and sixteenth centuries and there are fine examples in the region, principally in the form of residential halls. Some of these have been acquired by, or presented to, the public and have thus been preserved for the benefit of future generations. [562]

Among the historic buildings within the city of Manchester are:

Heaton Hall, a Georgian building designed by Wyatt, and acquired by the corporation from the Earl of Wilton. The grounds form a fine public park and the buildings house a branch art gallery. The Wilton Chapel in Prestwich Church was the burial place of the Earls of Wilton from 1801 to 1885. The chancel, nave and aisles of this church were rebuilt in the sixteenth century. [563]

Wythenshawe Hall, the seat of the Tatton family from the fourteenth century, was presented to the corporation, together with the fine park in which it stands, by Sir Ernest and Lady Simon in 1926. The central block is the oldest part of the building, dating from Elizabethan and Jacobean times. The hall was besieged by the Parliamentarians during the Civil War of 1642 to 1644. [564]

Hough End Hall, known locally as Peacock Farm, was erected in 1596 by Sir Nicholas Mosley, who in that year purchased for £3,500 the Lordship of the Manor of Manchester. The rights of the Lordship remained with the Mosley family until they were acquired by the Manchester Corporation in 1845 for £200,000. Oliver Cromwell is said to have slept at Hough End Hall. [565]

Barlow Hall has been the home of the Barlow family since the reign of Edward I. The most notable member of the family was Edward Ambrose, "the martyr", who became a Benedictine monk. [566]

Platt Hall, a fine specimen of a Georgian residence, derives its name from a family which owned the land in the sixteenth century. The Worsleys acquired the land in 1625 and it remained with them until the present century. Lieut.-Colonel Worsley, born in 1622, was Manchester's first representative in Parliament. When Cromwell turned out the "Rump" Parliament it was Colonel Worsley who led the company of musketeers that cleared the House, and it was he who removed the Mace. [567]

Other halls of interest are Slade Hall, built in 1585; Hough Hall, Moston, erected during the reign of Henry the Eighth; Baguley Hall and

Clayton Hall, originally the residence of the Byron family and later of Sir Humphrey Chetham. [568]

The oldest domestic building in Manchester is Chetham's Hospital, built in the fifteenth century as the residence of the College of Clergy, who served the Collegiate Church nearby, now the Cathedral. During the Civil War the building fell into a state of disrepair. After many fluctuations of fortune it came into the hands of the trustees of the charitable Humphrey Chetham in the seventeenth century. They restored and endowed it for the maintenance of poor boys and the establishment of a free library. It thus became the oldest blue-coat school in the country. [569]

The Wellington Inn, Old Shambles, is almost the only remaining example in Manchester of the half-timbered buildings which were numerous in the early years of the nineteenth century. The main timbers of the building are Elizabethan, if not earlier. For more than a hundred years the lower storey has been an inn; formerly the house was the linen-draper's shop of the Byrom family. [570]

The Cathedral has been the cathedral church of the diocese of Manchester since 1847. Originally the parish church, it was collegiate in 1422. The main structure dates from the fifteenth century, but has been much restored during the intervening period. It stands on the site of a building dating back to Saxon times. [571]

Among the older city churches may be mentioned Cross Street Chapel, the oldest Nonconformist place of worship in Manchester, and St. Ann's Church. The former, which has suffered severely from enemy action, was built in 1693-94 and was badly damaged in 1715 by a Jacobite mob. Parliament subsequently voted £1,500 for its repair. St. Ann's Church was consecrated in the year 1712. [572]

The city of Salford possesses several interesting links with the past. The following are particularly noteworthy:

Ordsall Hall was for a long period the home of the ancient Radcliffe family, one of whom, Sir John Radcliffe, attended Edward the Third during the French Wars. The hall figures prominently in Harrison Ainsworth's novel "Guy Fawkes". It was restored some years ago. [573]

Kersall Cell, consisting largely of an ancient timber-framed structure, was the birthplace in 1692 of John Byrom, poet and author of "Christians, Awake". The building is now used as a centre

for the John Byrom Community Group, which has been established to maintain friendships formed by air-raid wardens of the lower Kersal district. [574]

Agecroft Hall, a fine example of black-and-white Elizabethan architecture, was originally the seat of the Langley's, a branch of the royal Plantagenets. The building was taken down in 1926, and re-erected at Richmond, Virginia, U.S.A. The illustrations on Plate 26, following, show the original building near Salford and also the reconstructed building in America. Photographs of the reconstructed building were kindly supplied by Councillor C. P. Hampson—a member of the Salford City Council and a keen local historian. [575]

Worsley is particularly rich in black-and-white half-timbered buildings (see Plate 27, following). The author is indebted to Mr. H. Lomax, the Clerk of the Council, for information about several of the older buildings:

Wardley Hall, the foundations of which are believed to have been laid in 1290, was rebuilt in the reign of Edward the Sixth, about 1550–51. It is quadrangular in form, half-timbered, and was originally surrounded by a moat with a drawbridge across. The interior contains a fine staircase, an oak roof and oak panelling. It is now the residence of the Bishop of Salford. [576]

Worsley Old Hall, situated off Walkden Road and Leigh Road, is a fine example of the Elizabethan period. It has been the residence successively of the Worsleys, the Masseys, the Stanleys, the Breretons and the Egertons. It is surrounded by beautiful park-lands. [577]

The Court House, at the junction of Worsley Road and Barton Road, was formerly a petty sessional court for the trial of cases from the neighbourhood around Worsley. The interior of this picturesque building has some fine oak paneling and beautiful old oak chairs and chest. [578]

Robert Fulton in 1779 made his first experimental steamboat on the Bridgewater Canal at Worsley. It was not a great success, being slower than the horse-drawn boats. Eventually a service of what were called "Bridgewater Canal Swift Packets" travelled from Worsley to Patricroft, Barton and Manchester. Passengers embarked at the boat steps near the Packet House, off Barton Road, Worsley. The packets have long since ceased to run but the Packet House remains as an interesting reminder. [579]

Middleton too, in the north-eastern part of the region, has several old buildings, among which may be noted:

Tonge Hall, a good example of a black-and-white timbered building which dates back to the reign of Henry the Eighth. The Tonge family retained possession of this building until 1726. It possesses a fine oak-panelled room of the Charles the First period. [580]

Hopwood Hall is a fine example of Tudor architecture. There was originally a building on the site in 1277. When Lord Byron lived at Royton Hall he often visited Hopwood, and is said to have written part of "Childe Harold" there; one room is still known as the "Byron" room. [581]

Alkrington Hall, standing on an eminence, is of plain brick, dated 1736. Before this there was a hall on the site belonging to the Lever family. The grounds are now a public park. [582]

Middleton Parish Church has been rebuilt at various times, and contains a fine Norman arch (A.D. 1120). The south side was built by Sir Ralph Assheton, who was the Lord of the Manor in 1524. Until 1940 curfew was rung every night at 10 p.m. [583]

Ye Olde Boar's Head takes its name from the wild boars that used to roam the Middleton woods. It is a black-and-white timbered building, part being dated A.D. 1752. The old sessions room is next door. [584]

The old Grammar School was endowed by Queen Elizabeth and is now used only as a Sunday school, having been replaced by the new Queen Elizabeth's Grammar School in Rectory Street. [585]

At Fairfield, Droylsden, the religious society of Moravians built a village around the Moravian Church and College, an interesting reminder of early planning efforts. [586]

Hyde Hall, Denton, is a good example of black-and-white half-timbered architecture. The oldest part of the building probably dates back to the fifteenth century. Over the entrance gateway is a shield bearing the arms of the Hydes and dated 1625. The building has many fine oak-panelled rooms and is in sound condition. [587]

Denton Old Church, according to the Rev. John Booker in his work "A History of the Ancient Chapel of Denton", was erected in the year 1531 by the local landed families. Since then it has undergone considerable extension and alteration. [588]



1



2



3



4

1. Manchester Cathedral

2. Wythenshawe Hall, Manchester

Presented to the City Council in 1926 by Sir Ernest and Lady Simon, together with the fine park in which it stands.

3. Clayton Hall

Originally the residence of the Byron family, and later of Sir Humphrey Chetham.

4. Platt Hall

A fine specimen of a Georgian residence.



1

Agecroft Hall

A fine example of Elizabethan architecture. The building was taken down in 1926 and re-erected at Richmond, Virginia, U.S.A.

1. The Hall, standing on its original site

2 & 3. Views of the Hall as re-erected in America



3



2

AGECROFT HALL



1. Wardley Hall, Worsley

The residence of the Bishop of Salford.

2. The Packet House, Worsley

A reminder of the days when the "Bridge-water Canal Swift Packets" travelled between Worsley and Manchester.



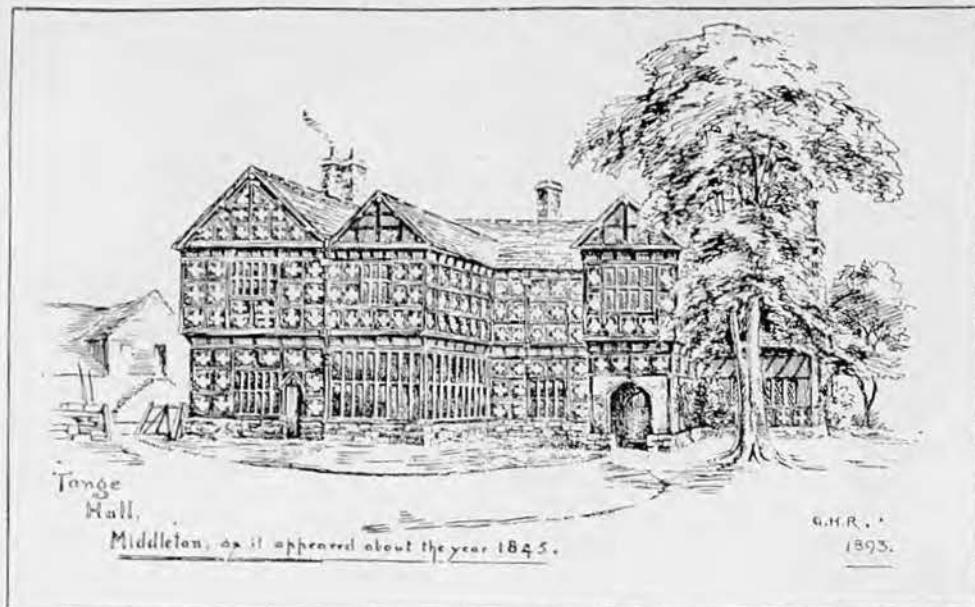
3. Worsley Old Hall

A fine example of the Elizabethan period.

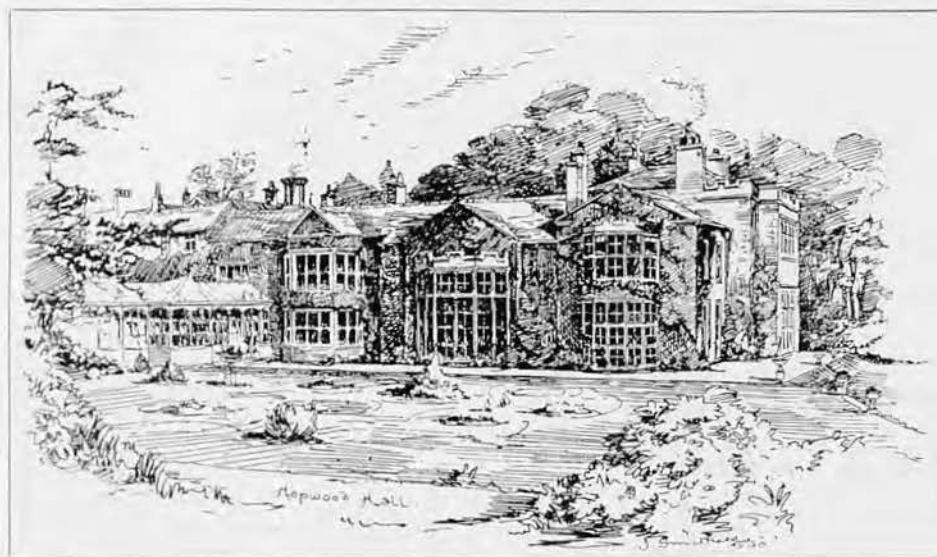
4. Worsley Court House

Worsley is particularly rich in black-and-white half-timbered buildings.





1



2



3



4

1. Tonge Hall, Middleton  
Dating back to the reign of Henry the Eighth.
2. Hopwood Hall, Middleton  
A fine example of Tudor architecture.
3. Chetham's Hospital, Manchester  
From an engraving dated 1821.

4. Fairfield, Droylsden (1862)  
It was here that the religious society of Moravians built a village around the Moravian Church and College.

## LEGISLATION

THE TOWN and Country Planning Act, 1944, the Government White Paper on the Control of Land Use (Cmd. 6537, H.M. Stationery Office), and the General Interim Development Order, 1945, when taken together, show a substantial advance in planning thought. If legislation follows the principles outlined it will secure a considerable step forward in planning. [589]

The extent to which they will bring into being development and redevelopment of the type that is so necessary to the welfare of the community will largely depend upon the manner in which the Minister uses his powers. However, the general experience has been that the interpretation of planning legislation broadens with each year of use and a continuation of this trend can presumably be expected in the future. [590]

There are many points in the White Paper on which further information and clearer definitions are necessary before their full implication and effects can be comprehended, and the proposals must be worked out in greater detail before they can be passed into law. These proposals are envisaged by the Government as a "promising approach" to the problems involved in post-war development and reconstruction. Paragraph 40, page 15, states:

The Government believe that if the Town and Country Planning Bill now before Parliament, and the corresponding Scottish Bill became law and the proposals outlined in this Paper met with general approval and were in due course embodied in legislation, a statutory basis would be created on which a fresh and promising approach could be made after the war towards securing the best use of the land of the country, both urban and rural. [591]

The White Paper offers a basis for securing the collection of betterment and of limiting compensation so that positive planning may be undertaken, while the Town and Country Planning Act, 1944, gives powers to secure the redevelopment of areas of extensive war damage and of areas of bad layout and obsolete development. Taken together,

they suggest a piecemeal handling of selected sections of built-up areas, rather than comprehensive replanning upon an ordered time programme designed to make towns and cities functionally and aesthetically satisfying. [592]

The Uthwatt Committee, on the other hand, envisaged "plans on bold lines framed according to the dictates of good planning, and involving, where necessary, a complete disregard of existing layouts". Its report made special reference to statements by Government spokesmen to the effect that post-war reconstruction should have as one of its aims the creation of worthy centres of living, sufficient to meet the needs of modern civilisation and to provide citizens with a healthy environment both for work and for pleasure. [593]

For this purpose a new type of legislative approach is needed. Planning must concern itself with the needs of the next generation, but legislation is usually framed to meet immediate requirements. It is essential, if the objects of planning are to be accomplished, that future legislation should be addressed to the needs of at least 25 years hence as well as to the needs of to-day. [594]

## Compensation and Betterment

The White Paper on the Control of Land Use proposes that all substantial changes of use, or of scale of use, should be subject to consent. Where an advantageous change is permitted 80 per cent of the betterment would be recoverable, and where refused fair compensation would be paid, provided such a refusal carried the right to compensation under the provisions of the Town and Country Planning Act, 1932. A condition precedent to any charge or payment is a proposal to change initiated by the owner. [595]

In built-up areas this proposal may give rise to serious complications both in defining and judging the change of use or in scale of use. The White Paper confirms this view by stating (paragraph 17) that "the term different use will need to be accurately defined". This will be very difficult to achieve

in practice and inevitably some inequity of treatment will arise. [596]

The major change from the Uthwatt proposals—the dropping of the general betterment levy—means that a steady rise in values of land in an existing residential estate, or a similar rise in a popular shopping street, due to an increase in residential population, will remain untaxed unless a change of scale occurs in some of the premises. [597]

It is reasonable to suppose that the Uthwatt proposal would have tended to accelerate the redevelopment of outdated properties while the White Paper proposal may well do the opposite. [598]

### Centralisation of Finance

A national collection of betterment charges and a national distribution of compensation, as envisaged in the White Paper, is probably desirable, but a regional administration of the fund by local or joint planning authorities might be preferable. [599]

The dangers of national administration are obvious. Each planning authority will, no doubt, endeavour to take the fullest advantage of the fund for the improvement of amenities in its own area. A sense of frustration and discontent may ensue if local aspirations are defeated by lack of support from national resources. Most important of all, the sense of local responsibility and endeavour will be substantially weakened. [600]

### Time Planning

It is essential that planning authorities should be enabled to reduce their liability for compensation in long-term redevelopment according to the length of notice they are able to give of their requirements. Much of the out-of-date residential development in the region has only been in existence some 60 or 70 years. We must get away from the idea that buildings—even commercial buildings—are permanent fixtures. [601]

The suggestion put forward by the Uthwatt Committee in regard to putting a "life" on non-conforming uses and buildings would be difficult to follow in practice and in its limited form cannot in any case be regarded as a sufficient basis for the long-term replanning of built-up areas. [602]

The redevelopment of a town centre in a manner likely to be satisfactory to our successors can in most cases be accomplished only by bringing

together a number of existing building sites into a single redevelopment scheme. In this connection, Sir Gwilym Gibbon in his evidence to the Barlow Commission on the Distribution of the Industrial Population proposed a scheme for the pooling of ownerships. The report quotes him as stating that:

... in particular, some form of pooling is essential for that replanning of existing towns which is so urgently needed for the better location of industries as well as for other purposes. The case for pooling in order to prevent the unfair drain of compensation, or wasteful compromises to avoid it, is reinforced by the necessity for some measure of pooling in order to ensure appropriate sites for good redevelopment. [603]

So that long-term planning may be fairly undertaken, a means must be found whereby areas which can only be satisfactorily redeveloped to a detailed plan can be prescribed. Such areas might broadly comprise the following:

- (a) frontages to major roads—in sufficient depth for comprehensive redevelopment to be secured, with new buildings planned to an internal road system, eliminating road parking on the main traffic routes and reducing the toll of accidents;
- (b) areas of congested residential development—forming part of a comprehensive neighbourhood redevelopment plan—which preferably should be cleared and redeveloped in one operation;
- (c) areas where, by reason of their situation, satisfactory architectural treatment can only be secured by a redevelopment scheme involving the pooling of existing ownerships;
- (d) areas to be reserved for neighbourhood and district centres and other special purposes, and
- (e) areas to be redeveloped for industrial purposes. [604]

It should be possible, with the approval of the Minister of Town and Country Planning, to define such areas either before or after a planning scheme has been adopted and, at the same time, to fix the approximate date at which, failing development or redevelopment in accordance with the detailed plan, the area may be acquired by the planning authority for the purpose of such development or redevelopment. Generally, the time for redevelopment will be when the average condition of the

existing property is such that it has reached the end of its useful and economic life. [605]

Such areas having been "timed", compensation in respect of the acquisition of the buildings at the end of the specified period should be related to the length of notice given when the area is first prescribed. Thus no compensation would be payable in respect of expensive maintenance and repair work beyond that essential to the maintenance of the building during the "time" period, or in respect of any renewal of leases effected during that time which obviously would be terminable at the specified redevelopment date. Compensation for goodwill and disturbance should be similarly graded. [606]

By means of "time" plans, redevelopment sites of adequate dimensions for modern methods of construction could be secured, and property owners would be able to adjust their leases and building expenditures accordingly, so that the compensation payable by the planning authority would not become unbalanced by reason of outstanding leases or extravagant and unnecessary building expenditures undertaken at too close an interval before the occasion arose for removal or setting back. A regular process of redevelopment, on a time basis, would provide continuous employment and act as a safeguard against depression. [607]

Another important aspect of replanning will be the necessity for closing a large number of unnecessary streets (e.g., those which are unsatisfactorily sited and which are undesirable from the point of view of road safety). These closings will not be economically effected unless the extension, alteration or reconstruction of frontage buildings can be satisfactorily controlled. [608]

While it is recognised that there would be many difficulties in the application of such a scheme, and that adequate safeguards against mere confiscation would be necessary, the complete absence of any powers of this character is likely to make it virtually impossible to provide for the gradual redevelopment of our towns and cities on sound economic principles. [609]

No reference is made in the White Paper to the proposal, referred to in Chapter 10 of the Uthwatt Report, that "all land in Great Britain be forthwith converted into leasehold interests held by the present proprietors as lessees of the State at a peppercorn rent for such a uniform term of years

as may reasonably, without payment of compensation, be regarded as equitable, and subject to such conditions enforceable by re-entry as may from time to time be applicable under planning schemes". The Committee said: "The immediate result of the adoption of the scheme would be that the State as landlord would enforce town-planning restrictions in the same way as is common under the long leasehold system in England and Wales... This method of securing compliance with town-planning restrictions would have the effect of impressing upon land owners that land-holding involves duties as well as rights." [610]

This proposal should not be lost sight of, as it would undoubtedly make planning easier for future generations. The adoption of such a scheme a century ago would have removed many of the most difficult of present-day planning problems. Planning is a continuous and everlasting process, and the difficulties of to-day will persist, possibly in somewhat different forms, in succeeding generations, unless in due time they are removed by a comprehensive control of land. [611]

## REALISATION OF THE PROPOSALS

The need to secure the powers and finance required by the plan is as great as the need to prepare the plan itself. The adoption of a policy which will lead to their early provision is overdue. [612]

The green-belt scheme (Chapter III) raises important questions about powers and financial ways and means in addition to technical problems. Early consideration of these matters is necessary in order that local authorities, and particularly the smaller authorities, may be encouraged to refuse permission for development in the green-belt area in the knowledge that fair and satisfactory financial arrangements covering any compensation which may be payable will be forthcoming. Otherwise the proposals will be prejudiced, particularly in the vital areas separating existing development. [613]

A clearer indication of Government policy is required before the financial implications can be fully appreciated. It is important to know whether the green-belt reservation would be accepted as a proper "process of planning" (paragraph 36, White Paper on the Control of Land Use) for which compensation would be paid out of national funds. [614]

The abolition of the slums and congested residential areas in the region demands bold measures. The standards for development and redevelopment set out in Chapter IV can in no wise be regarded as extravagant. There must be no risk of building future slums, which are due as much to the over-crowding of dwellings as to bad housing. [615]

The need for adequate powers to deal with the difficult problem of "overspill" has already been stressed. The transfer of populations to other areas will involve deep human, social and economic problems. Such removals must be reduced to the minimum compatible with decent living conditions and with a proper balance between housing, work and recreation. [616]

Planned neighbourhood development cannot fail to engender a sense of civic responsibility. The vast residential sprawl, too, must be broken into separate entities. As stated in "Design of Dwellings" (H.M. Stationery Office):

The principle behind the idea of the urban neighbourhood must be not merely to break down the large town into units of a size which will allow a full growth of community spirit and neighbourhood feeling, but to ensure that its redevelopment takes place in such a way that each unit, while still essentially part of a greater whole, becomes a comprehensive entity in itself. [617]

The industrial research that has been undertaken in the region has been on such a comprehensive scale that it cannot fail to be of inestimable value in considering the industrial requirements of this important area. Every encouragement must be given to those undertakers who wish to re-site their premises in more suitable and healthy surroundings. The parallel dispersal of residential population and industry will alleviate that considerable movement to and from work which would otherwise

take place. National funds must be available to assist and persuade industrial undertakings to move out to the new industrial areas and to the satellite developments. The erection by the dispersing authority of houses for such workers as the undertakers may specifically need or wish to transfer will also help to maintain a balanced transfer of industry and population. [618]

The effect of the anticipated increase in road traffic (Chapter VII) is not generally recognised. Future traffic cannot be moved through the built-up areas of the region except by roads specifically designed for the purpose. Many of the road accidents are at present caused by traffic using tortuous and perilous routes to avoid congested main roads. [619]

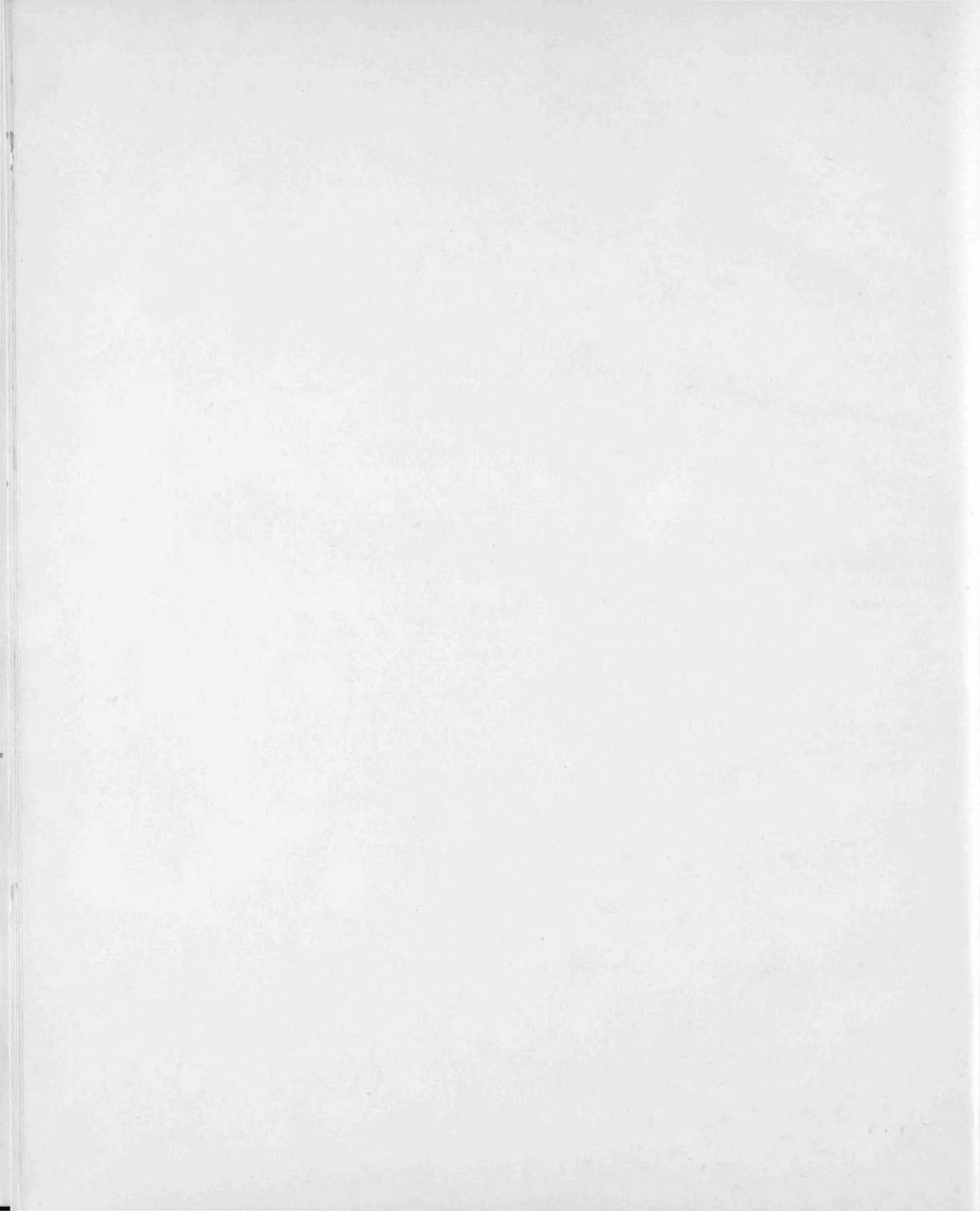
The proposals and suggestions embodied in this report form a guide to the detailed development and redevelopment of this important region. Much research work has still to be done. We cannot, at the time of writing, clearly envisage conditions—economic and social—at the end of the present conflict. We can, however, plan boldly now and adjust our plans as may from time to time be necessary. Planning must look a long way ahead, and it must be a day-to-day process. To-day's work must not prevent to-morrow's needs from being satisfied. Immediate plans may be modified to meet existing conditions, but should be constantly reviewed in the light of the long-term requirements. If this is done we shall not be guilty of passing on to future generations the standards of development which have been handed down to us, and which have brought us problems the extent of which we are only beginning to realise. [620]

## APPENDICES

1—POPULATION

2—INDUSTRIAL QUESTIONNAIRES

3—SURVEY OF EXISTING BUILDINGS



# APPENDIX 1

# POPULATION

## DEVELOPMENT OF POPULATION, MANCHESTER REGION (1921-1939)

District	1921	1922	1923	1924	1925	1926	1927	1928	1929
Manchester C.B. . .	744,000	746,986	752,100	755,119	758,235	755,083	757,319	759,563	761,813
Salford C.B. . .	239,100	240,700	241,600	243,700	244,200	247,400	247,600	241,500	235,600
Eccles M.B. . .	44,960	45,090	45,270	46,020	45,960	45,670	45,390	45,200	45,040
Middleton M.B. . .	28,910	28,930	28,870	28,790	28,860	28,360	28,910	29,010	29,470
Prestwich M.B. . .	18,900	18,990	19,140	19,450	19,450	20,520	21,120	21,670	21,670
Stretford M.B. . .	46,535	47,530	47,920	48,670	48,460	50,280	51,540	52,110	52,240
Swinton and Pendlebury M.B.	31,580	31,780	32,000	32,660	33,400	33,820	34,750	34,010	34,370
Audenshaw U.D. . .	7,878	8,050	8,050	8,050	8,050	8,050	8,340	8,524	8,580
Denton U.D. . .	17,631	17,950	17,970	17,900	17,770	17,150	17,010	17,600	17,750
Droylsden U.D. . .	13,645	14,150	14,220	14,170	14,170	13,370	13,779	13,690	13,730
Failsworth U.D. . .	16,792	17,360	17,280	17,220	17,190	16,690	16,640	16,840	16,860
Irlam U.D. . .	9,600	10,030	11,300	11,800	11,920	12,290	11,790	12,220	12,190
Urmston U.D. . .	*8,297	*8,300	*8,300	*8,300	*8,383	*8,500	*8,600	*8,600	*8,600
Worsley U.D. . .	14,190	14,190	14,430	14,434	14,490	14,680	14,680	14,720	14,760
Total for the region . .	1,242,018	1,250,036	1,258,450	1,266,283	1,270,538	1,271,863	1,277,468	1,275,257	1,272,673

District	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Manchester C.B. . .	764,070	766,378	768,745	771,165	773,593	776,028	759,058	751,371	747,318	736,318
Salford C.B. . .	230,100	225,900	220,300	217,000	213,850	210,000	206,000	201,800	199,400	196,600
Eccles M.B. . .	45,040	44,770	44,434	44,942	43,370	42,900	42,770	42,560	42,550	42,630
Middleton M.B. . .	29,470	29,520	29,210	29,010	28,880	29,040	29,110	29,040	29,450	29,850
Prestwich M.B. . .	21,590	23,980	24,940	26,100	27,180	29,120	30,500	31,710	32,410	32,860
Stretford M.B. . .	52,240	56,795	56,520	57,220	58,460	59,250	59,500	59,690	59,670	59,670
Swinton and Pendlebury M.B.	35,233	33,170	34,675	†38,300	38,400	38,740	38,980	39,690	40,360	41,120
Audenshaw U.D. . .	8,554	8,546	8,806	9,126	9,698	10,380	11,060	11,460	11,870	12,000
Denton U.D. . .	17,750	17,580	17,620	17,870	18,270	18,770	19,670	21,090	21,090	22,830
Droylsden U.D. . .	13,730	13,270	14,320	15,110	16,170	17,100	17,110	21,490	23,710	24,940
Failsworth U.D. . .	16,860	16,330	15,920	15,830	15,800	16,370	16,740	16,990	17,370	17,480
Irlam U.D. . .	12,500	13,030	13,010	13,030	13,120	14,000	14,400	14,360	14,520	14,400
Urmston U.D. . .	*9,000	*9,284	*9,400	†26,464	26,630	27,980	28,850	30,500	32,030	33,530
Worsley U.D. . .	14,760	15,000	15,000	†22,376	22,730	23,423	24,200	24,500	24,920	25,300
Total for the region . .	1,270,897	1,273,553	1,272,900	1,303,543	1,306,151	1,313,101	1,297,948	1,296,251	1,296,668	1,289,528

† Extension of boundary.

The foregoing figures are based on those provided by the Medical Officers of Health except in cases marked \* which appear in the Municipal and other Year Books.

(1) Letter accompanying Questionnaire "A"  
 (2) Questionnaire "A"

(3) Letter accompanying Questionnaire "B"  
 (4) Questionnaire "B"

**(1) INDUSTRIAL QUESTIONNAIRE**  
 FORM "A" (*Accompanying Letter*)

Dear Sir(s),

In connection with long-term Planning Proposals it is essential that the Regional Planning Committee should have a complete appreciation of the existing (normal pre-war) industrial structure in the Regional Planning Area, and that they should also study the extent to which post-war and long-term Planning can provide facilities which will, so far as Planning can, ensure the future industrial prosperity of the Region.

One Planning problem, which will undoubtedly receive some priority after the termination of hostilities, arises from the necessity for the future redevelopment of the congested residential areas of the Region. Many of these areas are so densely developed that redevelopment in accordance with modern standards will necessitate the decentralisation or dispersal of a substantial part of the overcrowded populations.

There are, no doubt, many Industrial Undertakings at present housed in accommodation which will, in due course, be no longer suitable for their future requirements, or which will not permit of desirable expansion, whilst, even Undertakings more favourably placed, may find it advantageous, when the time for rebuilding comes, to move to new sites where land can be cheaply leased, so that an open healthy form of development can be obtained, room reserved for future expansion, and good facilities for road and/or rail transport secured.

Just as modern standards of housing development necessitate decentralisation or dispersal of overcrowded population, so may modern requirements in regard to healthy and efficient working conditions make it desirable that some industrial development should be re-sited as and when the time for redevelopment arrives.

One principal Planning Problem will, no doubt, be to encourage comparable dispersals of population and industry,

so that the populations so dispersed may still have the advantage of living comparatively close to their work, thereby minimising fatigue from long travelling hours, and the costs involved.

In order that the Committee may be fully informed on the existing industrial structure, and on the problems and difficulties which will arise in dispersing industries, or particular industries, the accompanying Questionnaire has been prepared in collaboration with the Manchester Chamber of Commerce. The Committee are desirous of your co-operation and will welcome and appreciate your answers to the questions set out therein, together with any observations you may care to make.

IN ANSWERING THE QUESTIONNAIRE YOU WILL BE ENSURING THAT THE COMMITTEE ALSO HAVE A PROPER KNOWLEDGE OF YOUR REQUIREMENTS.

The Questionnaire is being forwarded to all types of Industrial Undertakings, and must not be taken as indicating that the desirability of removing any particular Undertaking from its present site is even being considered. Obviously, such considerations can only follow a comprehensive knowledge of the problems involved.

It will, of course, be appreciated that if, as part of a long-term policy, any question of removal should arise, then this would be the subject of fair negotiation with the object of reducing difficulties to a minimum and making any such removal as advantageous as possible, both from a Planning point of view and from the point of view of the particular Undertaking concerned.

Yours faithfully,

(*Hon. Surveyor*)

**(2) QUESTIONNAIRE FORM "A"**

1. Name of firm.....

2. Address.....

3. Nature of industry.....

4. Number of persons normally employed  
 (say, in 1937) *Males* *Females* .....

5. Classification of labour in (4) above:  
 (a) Unskilled employees .....

(b) Skilled manual employees .....

(c) Machinists, supervisors, etc. .....

(d) Clerical and administrative staff .....

6. Number of persons employed at present time .....

7. Have you under consideration any proposals which will enable you to retain any, or all, of your wartime increase (if any) of trained employees?

If so, kindly give approximate increase you consider you may be able to retain over your 1937 figures.

8. Is the firm part of a major organisation?

If so, kindly give particulars.

9. Is the firm "linked" with any other industry, i.e., do you use the by-products or products made by other industries or produce such by-products or products for the use of other undertakings?

If so, in what manner and from what industries?

10. Are there advantages in the present situation of your Undertaking due to:
  - (a) "Linkage" with other industry.
  - (b) Deliveries of raw materials.
  - (c) Nearness of labour market.
  - (d) Transport facilities, rail, road, or canal.
  - (e) Any other matters.
11. Are there disadvantages in an ultimate re-siting of your premises? If so, kindly state reasons.
12. Would possibilities of moving be facilitated by:
  - (a) The prior erection of factory units which could be leased for a period of, say, 21 years or more.
  - (b) The provision and reservation of houses in the vicinity of the new industrial area for skilled workers.

### (3) INDUSTRIAL QUESTIONNAIRE FORM "B" (Accompanying Letter)

Dear Sir(s)

In connection with long-term Planning Proposals, it is essential that the Regional Planning Committee should have a complete appreciation of the existing (normal pre-war) industrial structure in the Regional Planning Area, and that they should also study the extent to which post-war and long-term Planning can provide facilities which will, so far as Planning can, ensure the future industrial prosperity of the Region.

In order that the Committee may be fully informed on the existing industrial structure and on the problems and difficulties of particular industries, the accompanying Questionnaire has

- (c) The construction of "flatted factories" which might be available for part leasing of a floor, part of a floor, or part of a building.
- (d) Any other matters.
13. Has your Undertaking expanded or contracted during the period between the two wars?
14. (a) Have you any observations as to the future prosperity of your Undertaking?  
(b) Could Planning help to increase prospects in this direction? If so, in what way?
15. Any remarks which you may wish to make.

Date..... Signed.....

been prepared in collaboration with the Manchester Chamber of Commerce.

The Committee are desirous of your co-operation, and will welcome and appreciate your answers to the questions set out therein, together with any observations you may care to make.

In answering the Questionnaire, which is being forwarded to all types of Industrial Undertakings in the Region, you will be ensuring that the Committee will have a proper knowledge of your requirements and of the industrial structure generally.

Yours faithfully,

(Hon. Surveyor)

### (4) QUESTIONNAIRE FORM "B"

1. Name of firm.....
2. Address.....
3. Nature of business.....
4. Number of persons normally employed  
(say, in 1937) .....
5. Classification of labour in (4) above:
 

Males	Females
(a) Unskilled employees .....	.....
(b) Skilled manual employees .....	.....
(c) Machinists, supervisors, etc. .....	.....
(d) Clerical and administrative staff .....	.....
6. Number of persons employed at present time .....
7. Have you under consideration any proposals which will enable you to retain any, or all, of your wartime increase (if any) of trained employees?  
If so, kindly give approximate estimated increase you consider you may be able to retain over your 1937 figures.
8. Is the firm part of a major organisation?  
If so, kindly give particulars.
9. Is the firm "linked" with any other industry, i.e., do you use the by-products or products made by other industries or produce such by-products or products for the use of other undertakings?  
If so, in what manner and from what industries?

10. Are there advantages in the present situation of your Undertaking due to:
  - (a) "Linkage" with other industry.
  - (b) Deliveries of raw materials.
  - (c) Nearness of labour market.
  - (d) Transport facilities, rail, road, or canal.
  - (e) Any other matters.
11. Do you consider there is any need for the establishment in the district of any industries for the manufacture of goods which are either used in your industry or are made from by-products of your industry?  
If so, kindly give particulars.
12. (a) Can you suggest localities in which your Undertaking could be more suitably sited if and when reconstruction becomes necessary?  
(b) Have you any proposals in mind for a long-term re-siting of your Undertaking?  
If so, would this be likely to include the erection of houses by your Undertaking for your workers?
13. Has your Undertaking expanded or contracted during the period between the two wars?
14. (a) Have you any observations as to the future prosperity of your Undertaking?  
(b) Could Planning help to increase prospects in this direction?  
If so, in what ways?
15. (a) If you have become established in the Manchester Region as a result of the dispersal of industry resulting from the war, do you intend to stay permanently?  
(b) Are there any considerations in which Planning could assist which would influence you in this matter?
16. Any remarks which you may wish to make.

Date..... Signed.....

A survey has been undertaken of all buildings in the region to ascertain their age, condition, height and use. It was made with the following objects in view:

- (a) to indicate the position of residential, commercial and industrial "slums"—areas in which large scale redevelopment will be possible at an early date;
- (b) to obtain plans recording the relation to one another of specific types of development, e.g., houses, shops, offices, warehouses, cultural buildings, etc., and
- (c) to provide a diagrammatic guide in considering the

advantages and disadvantages of alternative schemes of road improvements.

The method of indication adopted has been by four narrow bands of colour on the plan along the street frontage of each building—the colours being graded so that the darkest indicate the most important use, the most recent date of construction, the greatest number of storeys and the best conditions.

The principal public services, e.g., sewers, water and gas mains, electricity and post-office cables, have also been recorded.

#### EXISTING BUILDINGS SURVEY—CLASSIFICATION AND NOTATION

##### *First Line—Building User*

Houses .. .. .. .. .. ..	Yellow
Flats and unlicensed residential .. .. .. .. .. ..	Broken yellow
Shops and houses .. .. .. .. .. ..	Burnt sienna
Churches, public buildings and cinemas .. .. .. .. .. ..	Emerald green
Public houses and licensed premises .. .. .. .. .. ..	Prussian blue
Licensed residential .. .. .. .. .. ..	Broken prussian blue
Warehouses .. .. .. .. .. ..	Vandyk brown
Shops with warehouses over .. .. .. .. .. ..	Broken vandyk brown
Office buildings with warehouse accommodation .. .. .. .. .. ..	Brick red
Offices, banks, etc. .. .. .. .. .. ..	Broken brick red
Shops with offices over .. .. .. .. .. ..	Scarlet
Industrial .. .. .. .. .. ..	Purple lake
Garages .. .. .. .. .. ..	Grey

##### *Second Line—Age of Buildings*

Before 1850 .. .. ..	Yellow
1850 to 1890 .. .. ..	Green
1890 to 1915 .. .. ..	Blue
1915 to 1932 .. .. ..	Scarlet
1932 and after .. .. ..	Purple

##### *Third Line—Height of Buildings*

One storey .. .. .. .. .. ..	Yellow
Two storeys .. .. .. .. .. ..	Green
Three storeys .. .. .. .. .. ..	Blue
Four storeys .. .. .. .. .. ..	Scarlet
Five storeys and over .. .. .. .. .. ..	Purple

##### *Fourth Line—Condition of Buildings*

Poor .. .. .. ..	Yellow
Fair .. .. .. ..	Blue
Good .. .. .. ..	Scarlet
Excellent .. .. .. ..	Purple

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